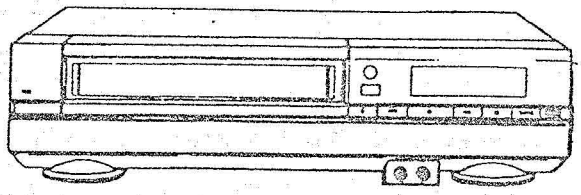
S/M Code No.90 – 047 DATE OF ISSUE 6/1990 – 1

AIWA®

HV-DK510MK II
HV-DK910MK II

SERVICE MANUAL



VIDEO CASSETTE RECORDER

◇ BASIC VIDEO MECHANISM : TN – 5900 ◇ TYPE : KE

SPECIFICATIONS

Recording/playback system
Video: Rotary 2 head helical scaning
Audio: Fixed head

Video signal
PAL/MESECAM color signal
625 lines, 50 Fields

Recording/playback time
4 hours max. with E-240 tape, standard speed

Fast forward/rewind time
Less than 300 sec., with E-240 tape

Tape speed
Standard speed, 23.39 mm/sec.

Tape width
12.65 mm

Usable cassette
VHS video cassette

Timer display
24-hour cycle,
day, hour, minute,
digital fluorescent display

Timer recording
7 programs within 2 weeks
1 program for weekly recording

Channel coverage
B and G color TV system
VHF: 2 - 4 and 5 - 12 channels
UHF: 21 - 69 channels
D and K color TV system
VHF: 1 - 5, 6 - 12 channels
UHF: 21 - 60 channels

RF output
UHF channel between 30 and 39

RF output level
75 dB

Video input
0.5 – 2.0 Vp-p, 75 ohms unbalanced

Video output
1.0 Vp-p, 75 ohms unbalanced

Horizontal resolution
240 lines (nominal)

Video S/N (luminance)
43 dB (nominal)

Audio input
–10 dBs (nominal)

Audio output
–8 dBs, 2.2 k ohms

Audio frequency response
200 Hz – 8 kHz

Audio S/N
41 dB (nominal)

Operating temperature
5°C – 40°C

Power requirements
110 – 240 V AC, 50/60 Hz

Power consumption
21 watts

Dimensions
390 (W) × 95 (H) × 315 (D) mm

Weight Approx. 5.1 kg

* Design and specifications are subject to change without notice.

AIWA Co., Ltd.

Tokyo Japan

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STANDARD MAINTENANCE

1. SERVICE SCHEDULE OF COMPONENT

○ : Check ● : Change

DECK		Periodic Service Schedule			
Ref. No.	Parts Name	1000 h	2000 h	3000 h	4000 h
2-2	UPPER DRUM	○	●	○	●
4-6	PINCH ROLLER A		●		●
3-32	CAPSTAN MOTOR ASSY		●		●
5-27	CLUTCH ASSY		●		●
4-46	LM ASSY			●	
6-22	MAIN BELT		●		●
3-5	BT BAND ASSY		●		●
5-29	DRIVE BELT		●		●
4-41	BRAKE SHOE		●		●
6-1	LOADING BELT		●		●
5-26	FL BELT		●		●
2-5	DRUM EARTH			●	
4-21	ACE HEAD HV225211			●	
3-25	REEL ASSY			●	
4-50	FULL ERASE HEAD			●	

NOTE :

1. Clean all parts for the tape transport.
   Upper Drum with video head / Pinch Roller A
   ACE Head / Full Erase Head
2. After cleaning up the parts, perform all DECK ADJUSTMENT.

2. CLEANING

1. CLEANING OF "VIDEO HEAD" (See Figure-1)
   Head cleaning by using a chamois skin.

   — Procedure —
   1) Remove the "Cabinet, Steel".
   2) Put on a glove (thin type) to avoid touching the "Upper drum" and "Lower drum" with bare hand.
   3) Put a few drops of alcohol on the Chamois skin, and by slightly placing it against the "Head tip", allow the "Upper drum" to turn the right and left.

   — Remark —
   1) The video head is of very hard material, but since it is very thin, avoid cleaning it vertically.
   2) Wait for the cleaned part to dry out, before operating the unit.
   3) Do not reuse the Stained chamois skin.

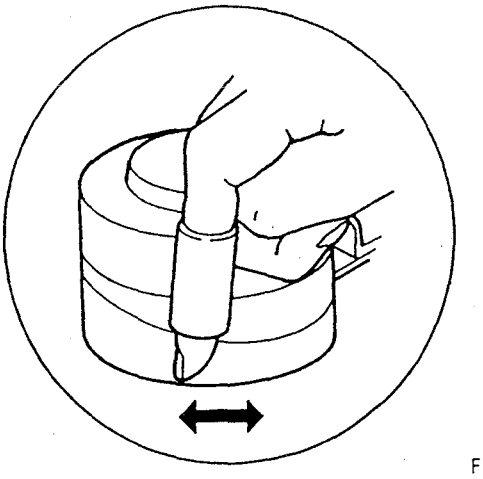


Fig-1

2. CLEANING OF "ACE HEAD" (See Figure-2)
   Head cleaning by using a chamois skin.

   — Procedure —
   1) Remove the "Cabinet, Steel".
   2) Put a few drops of alcohol on the chamois skin, clean up the "Audio control head", being careful not to damage the "Upper drum" and other tape running parts.

   — Remark —
   1) Avoid cleaning "ACE Head" vertically.
   2) Wait for the cleaned part to dry well, before operating the unit.

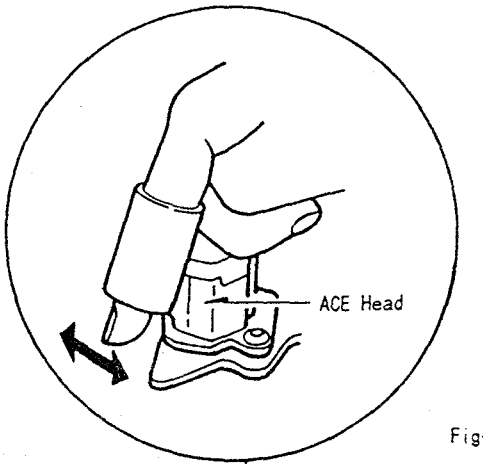
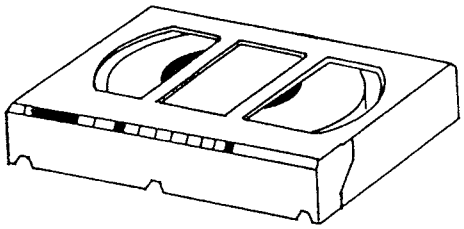


Fig-2

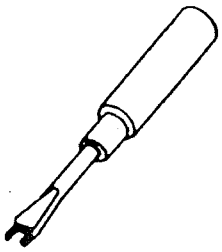
1. SERVICE JIG AND TOOLS

Ref. No.	Name	Adjustment
J-1	Torque Meter (FSJ-VHT-063)	Back Tension
J-2	Special Driver (SMALL)	Tape Running Position, Envelope Wave Form
J-3	Special Driver (LARGE)	X Value
J-4	Mirror	Tape Transportation Check
J-5	Alignment Tape (TTV-P2)	X Value, Envelope Wave Form, ACE Head Azimuth
J-6	Alignment Tape (TTV-P1)	ACE Head Height / ACE Head Tilt
J-7	Box Driver M3	Tape Running Position, X Value, Envelope Wave Form
J-8	EXT. PCB. KIT (A) (Parts No. 09-054-012-010)	HA (For repair of circuit board)

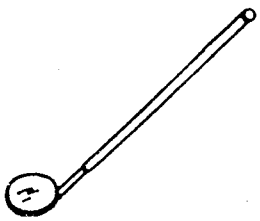
J-1, J-5, J-6



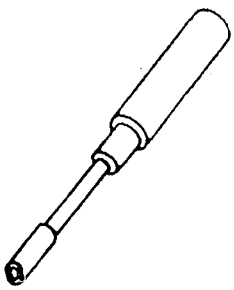
J-2, J-3



J-4



J-7



2. HOW TO ASSEMBLE THE JIGS

1. Assembling the J-8 (See Figure-1)

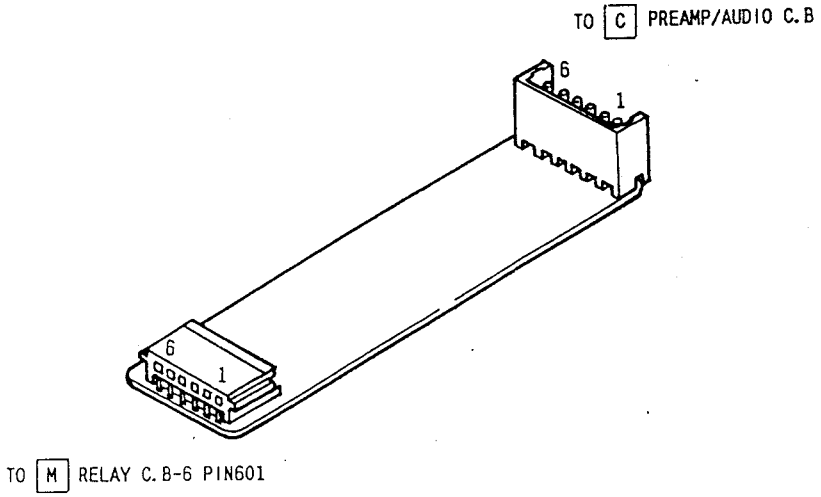


Fig-1

Place the circuit board with the solder side down as shown in the figure above and assemble the connectors, taking care of their directions.

2. Using the J-8 (See Figure-1)

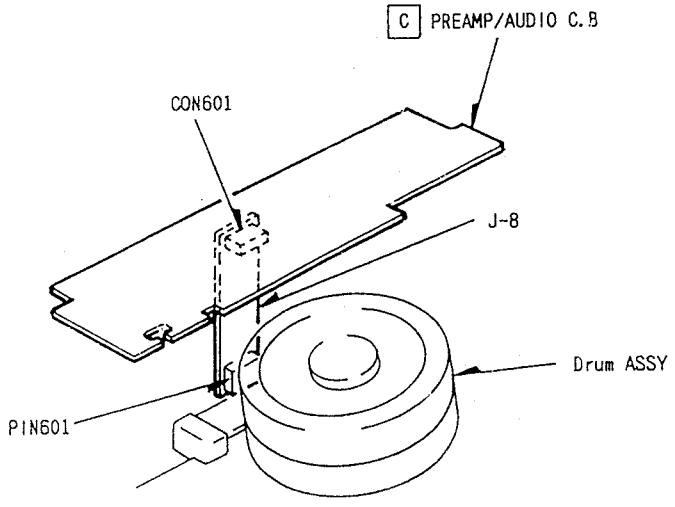


Fig-1

Use this jig when servicing the "Preamp/Audio circuit board".

DISASSEMBLY

1. "CABINET FRONT ASSY" REMOVAL (See Figure-1)
   1) Remove 4 screws (A) holding the "Cabinet, Steel".
   2) Remove 7 screws (B) holding the "Bottom, Plate".
   3) Remove 3 screws (C) and release 5 hooks to remove the "Cabinet front ASSY" in the direction of the arrow.

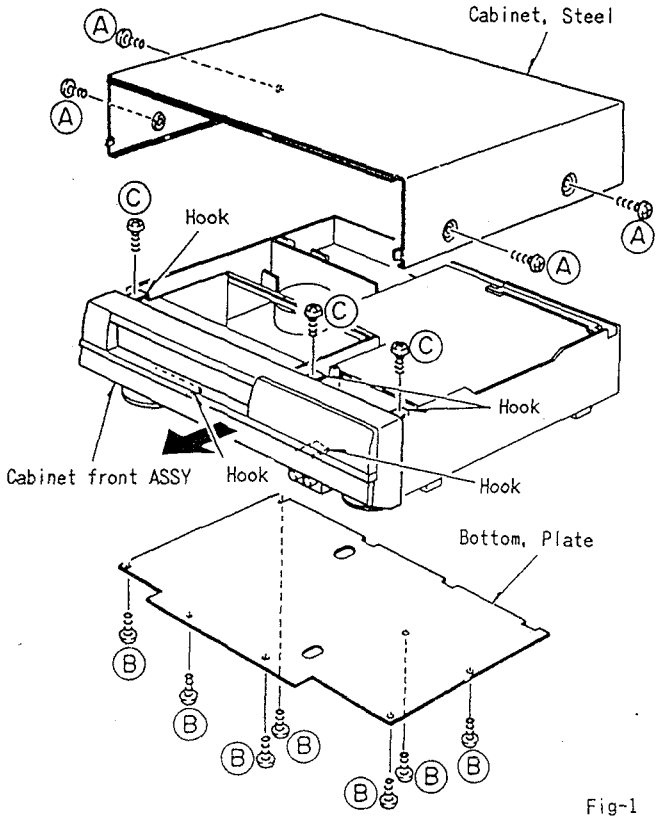


Fig-1

2. "POWER UNIT ASSY" AND "MAIN CIRCUIT BOARD" REMOVAL (See Figure-2)
   1) Remove 5 screws (A) holding the "Main circuit board".
   2) Remove 2 screws (B) and 2 screws (C) holding the "Power unit ASSY".

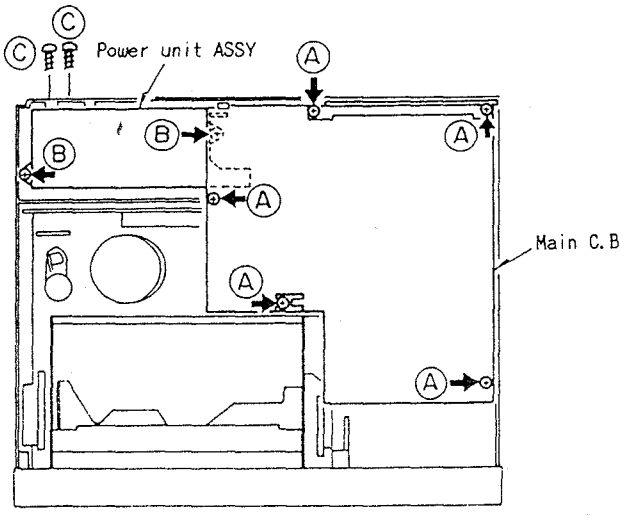


Fig-2

3. "MECHANISM ASSY" REMOVAL (See Figure-3)
   1) Remove screw (A) and disconnect the connector to remove the "Preamp/Audio circuit board" in the direction of the arrow.
   2) Remove 3 screws (B) holding the "Mechanism ASSY".

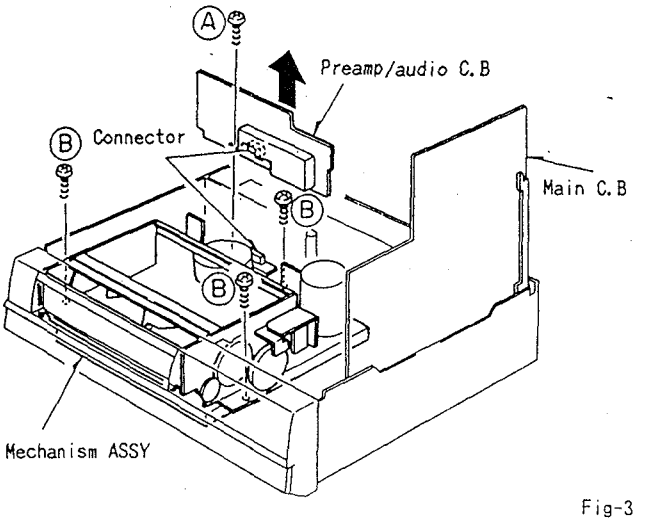


Fig-3

4. "FRONT LOADING ASSY" REMOVAL (See Figure-4)

1) Remove "Main belt".
2) Remove 4 screws Ⓐ.
3) Release the hooks on both sides and remove the "Front loading ASSY". (Since it is difficult to release these hooks, hold the front of the "Front loading ASSY" and shake it up and down to release them.)

5. "CASSETTE LOAD BRACKET ASSY" REMOVAL (See Figure-4)

1) Remove 1 screw Ⓑ.
2) Take off the "Cassette load bracket ASSY".

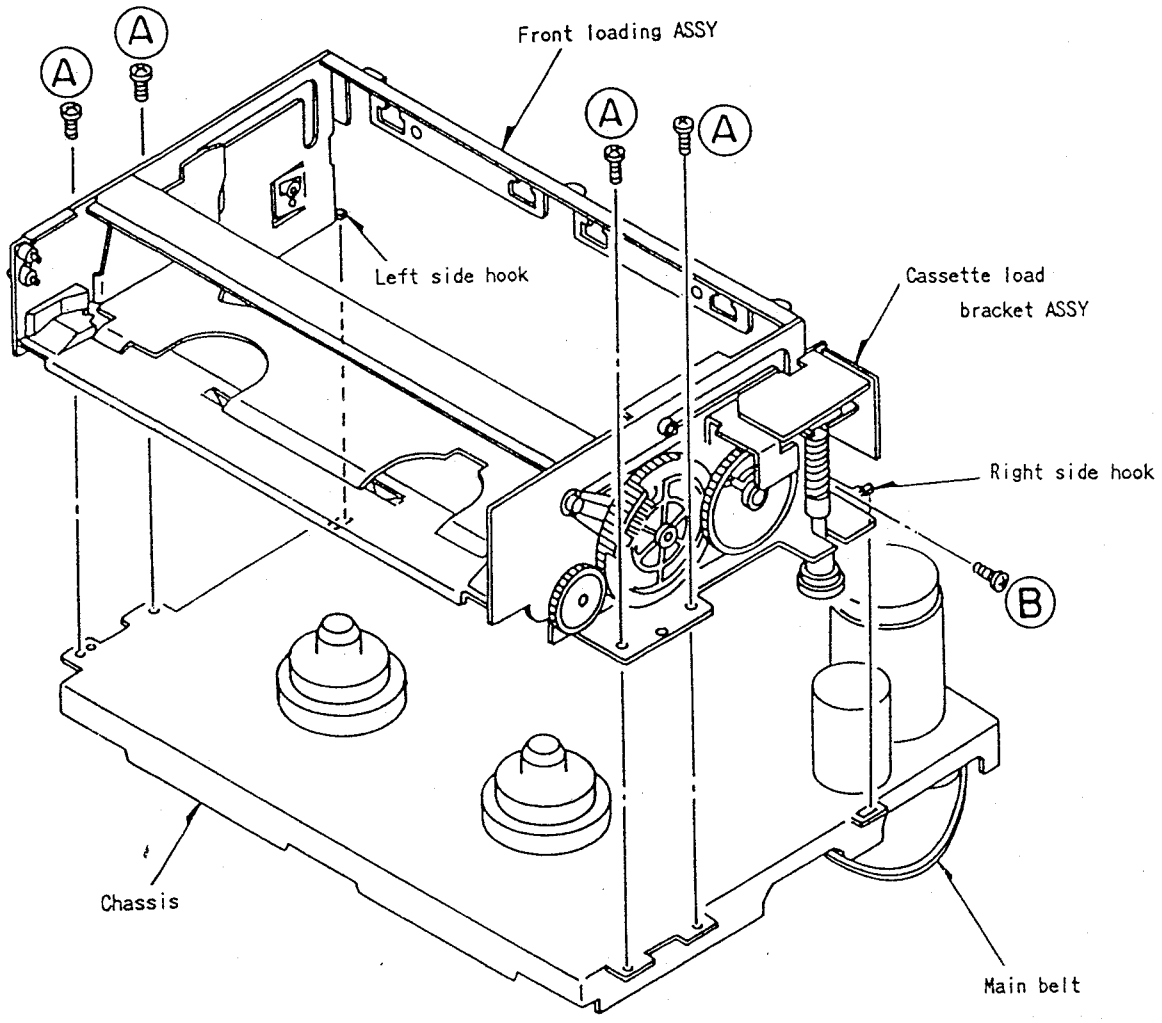


Fig-4

6. "PHOTO SENSOR ASSY" REMOVAL (See Figure-5)

1. "Lamp holder ASSY" Removal
   1) Remove 1 screw (A), and take off the "T soft brake ASSY".
      (At this time, never take off the "T-spring, soft brake arm".)
   2) Release the "Lamp holder ASSY" from hook (a) of the chassis and turn it counterclockwise to remove it from the chassis.
2. "Switch C.B", "Sensor guide" and "End sensor C.B" Removal
   1) Remove 1 screw (B) and take off the "Switch C.B".
   2) Remove 1 screw (C) and take off the "Sensor guide".
   3) Remove 1 screw (D) and take off the "End sensor C.B".
3. "Sensor guide" and "Start sensor C.B" Removal
   1) Remove 1 screw (E) and take off the "Sensor guide".
   2) Remove 1 screw (F) and take off the "Start sensor C.B".

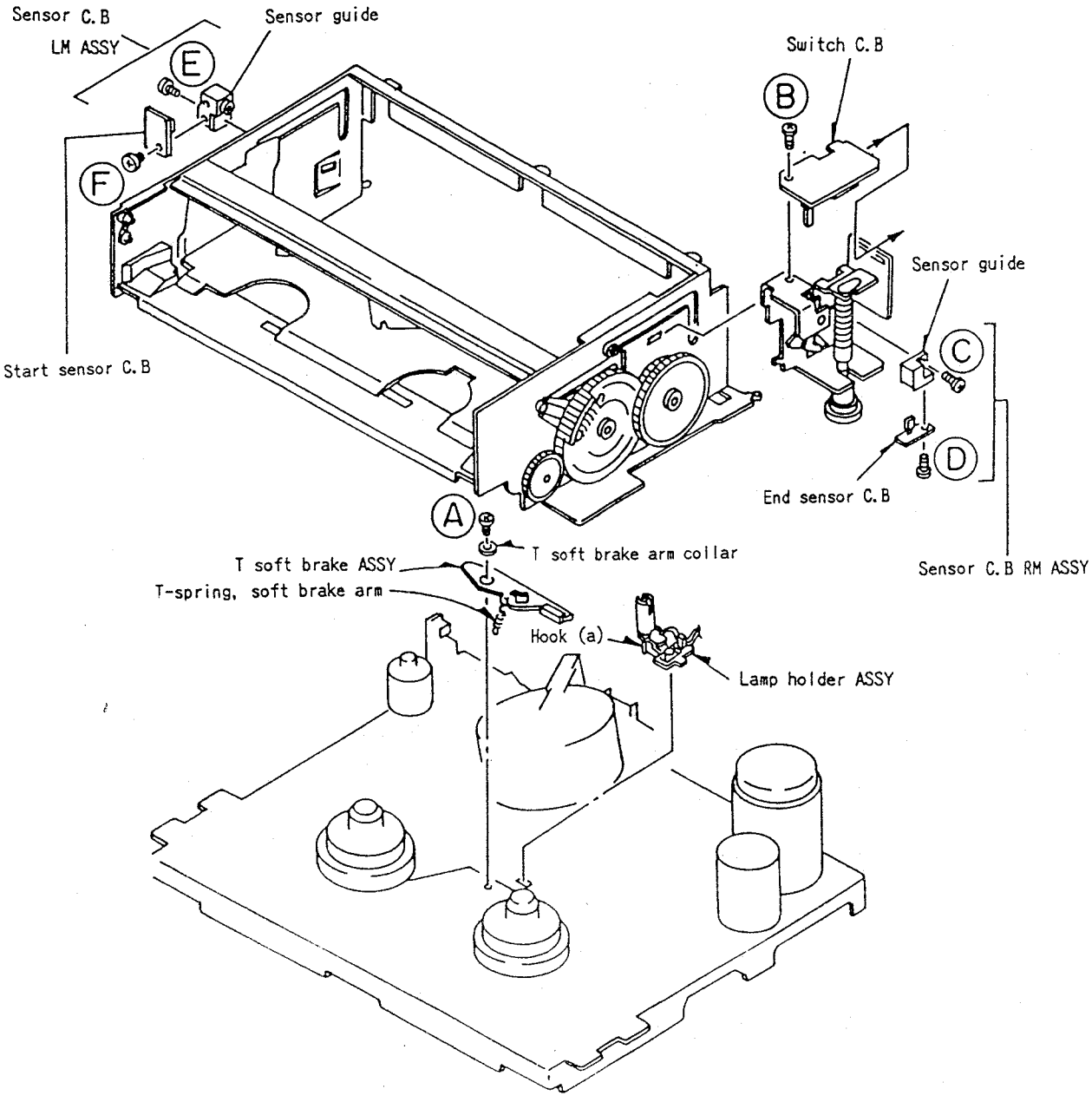


Fig-5

7. "FE PLATE" AND "ACE HEAD" REMOVAL (See Figure-6)

1. "FE plate" Removal
   1) Remove Nut (A).
   2) Take out the "Impedance roller" and pull up the "FE plate".
      (Take care not to lose parts "Impedance roller", "Impedance roller sleeve", "Tape guide frange A", "Tape guide flange spring" and "Plane washer 3×8×0.5" at the time of the "FE plate" removal.)
   3) Remove 1 screw (B) and take off the "Full erase head".
2. "ACE head" Removal
   1) Remove 3 screws ((C)×1, (D)×1, (E)×1) and "Azimuth spring".
   2) Remove "ACE head".

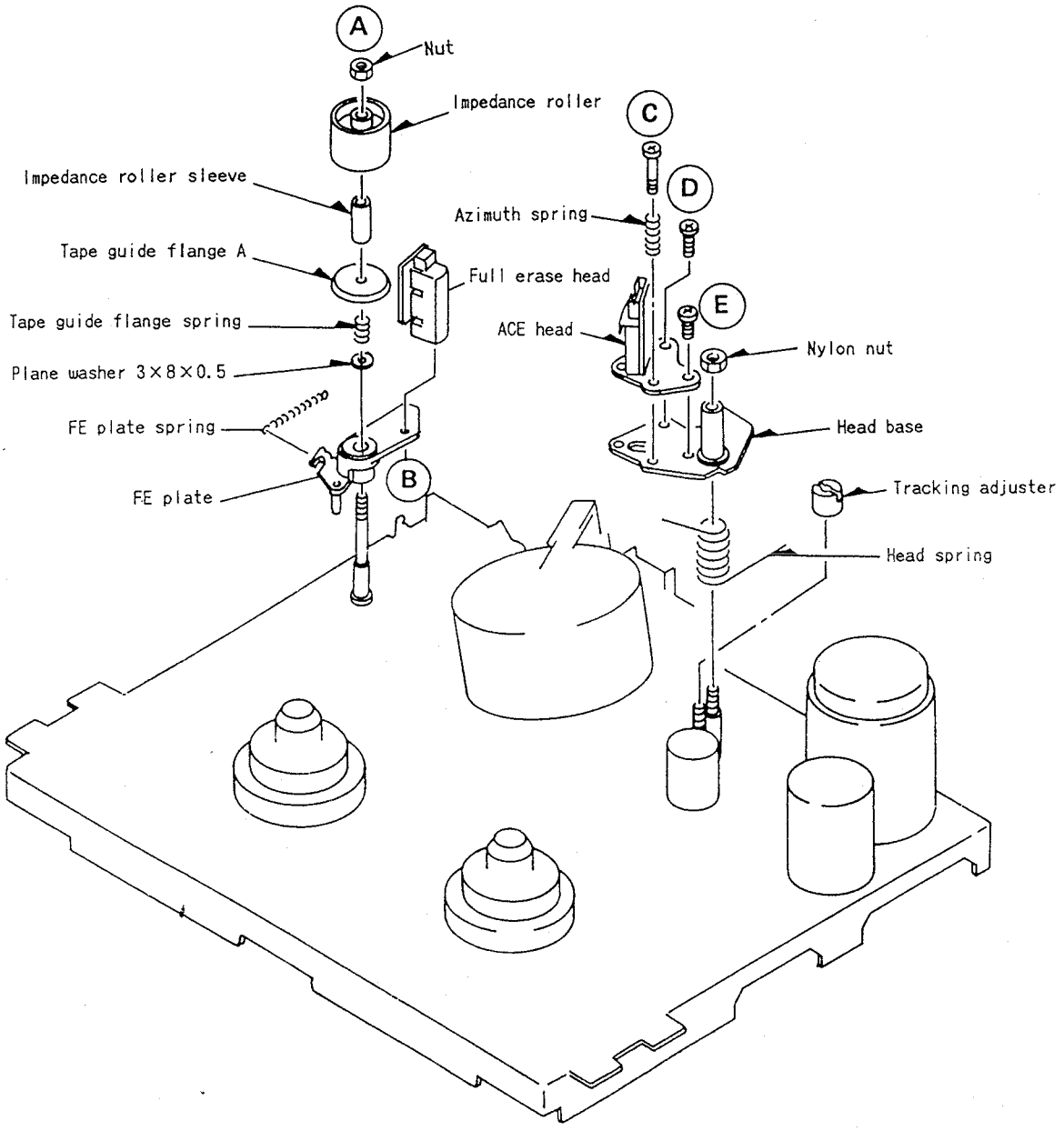


Fig-6

8. "GEAR HOLDER ASSY" REMOVAL (See Figure-7)

1) Remove the "Front loading ASSY".
2) Remove "Drive belt".
3) Remove Poly-Washer and "Middle pulley ASSY".
4) Remove Nylon-Washer (A) and take off the "Clutch ASSY".
5) Remove 1 screw (B) and 2 screws (C) and take off the "Gear holder ASSY".
6) Remove 1 screw (D) and take off the "T-spring, soft brake arm".
7) Take off the "T soft brake ASSY".
8) Remove 2 "E-Rings (E)" and take off the 2 "Reel drive gear".

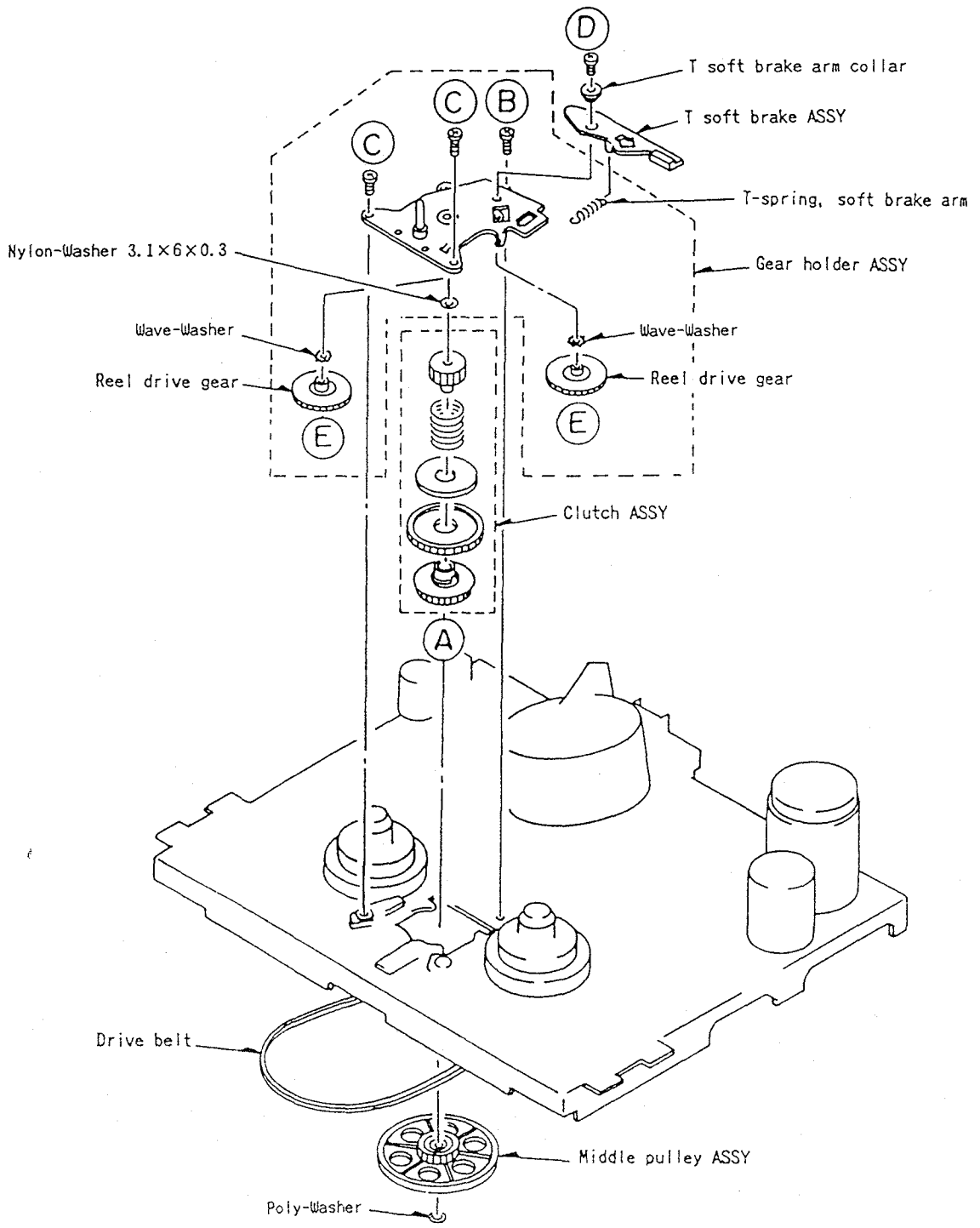


Fig-7

9. "BT BAND ASSY" AND "BT ARM SEMI ASSY" REMOVAL (See Figure-8)

1) Remove the "Front loading ASSY".
2) Remove Poly-Washer (A) and "BT actuate plate spring" from the "BT arm semi ASSY".
3) Remove 1 screw (B) and "Band holder spring".
4) Take off the "BT band ASSY" from the "BT arm semi ASSY".

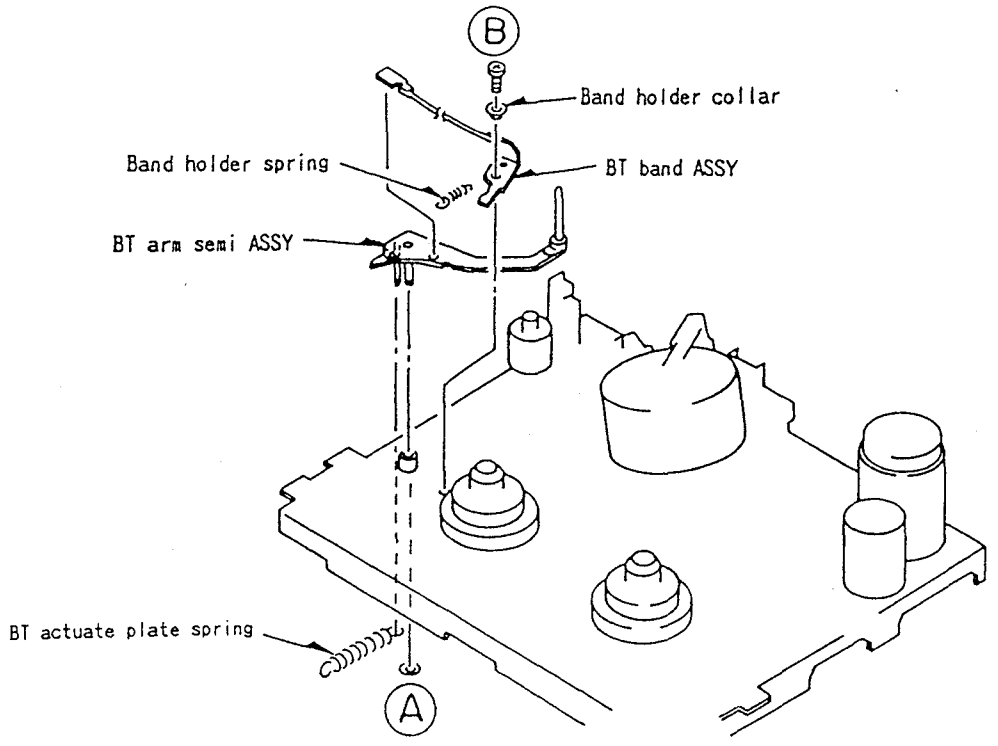


Fig-8

10. "REEL ASSY" REMOVAL (See Figure-9)

1) Remove the "Front loading ASSY", "Gear holder ASSY" and "BT band ASSY".
2) Remove 1 screw (A) and the "Back tension support".
3) Remove the 2 "Reel ASSY".

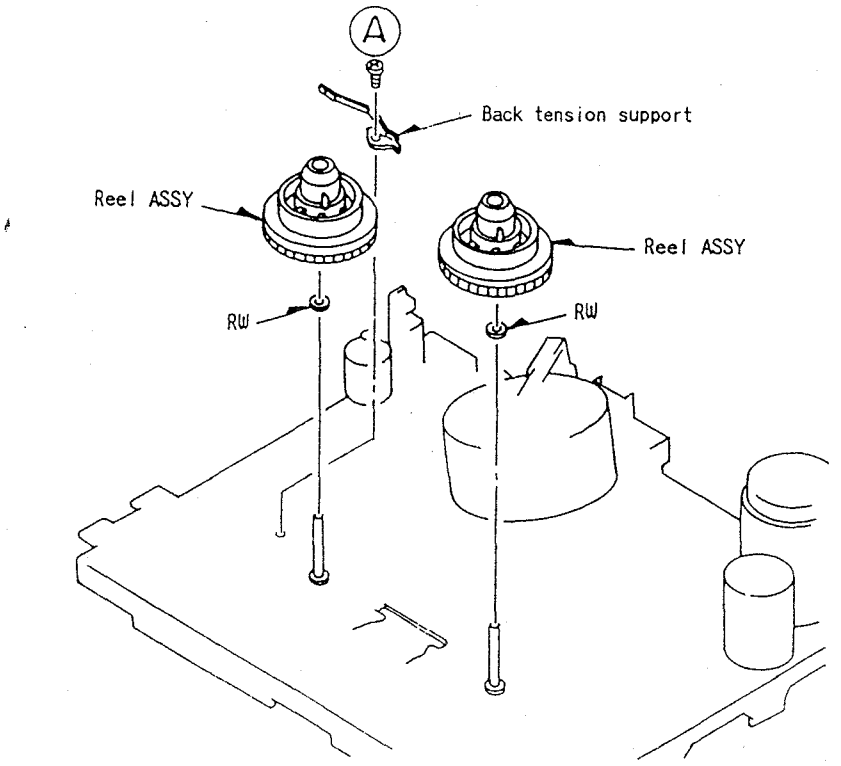


Fig-9

11. "CYLINDER ASSY" REMOVAL (See Figure-10)

1) Remove the "Front loading ASSY".
2) Pull out the "RELAY C.B-5" from the "Cylinder motor TM82".
3) Remove 1 screw (A) and take off the "Drum earth".
4) Remove 3 screws (B) and take off the "Cylinder ASSY".

≡Remarks≡

Take off the "Cylinder ASSY" carefully without any damage.

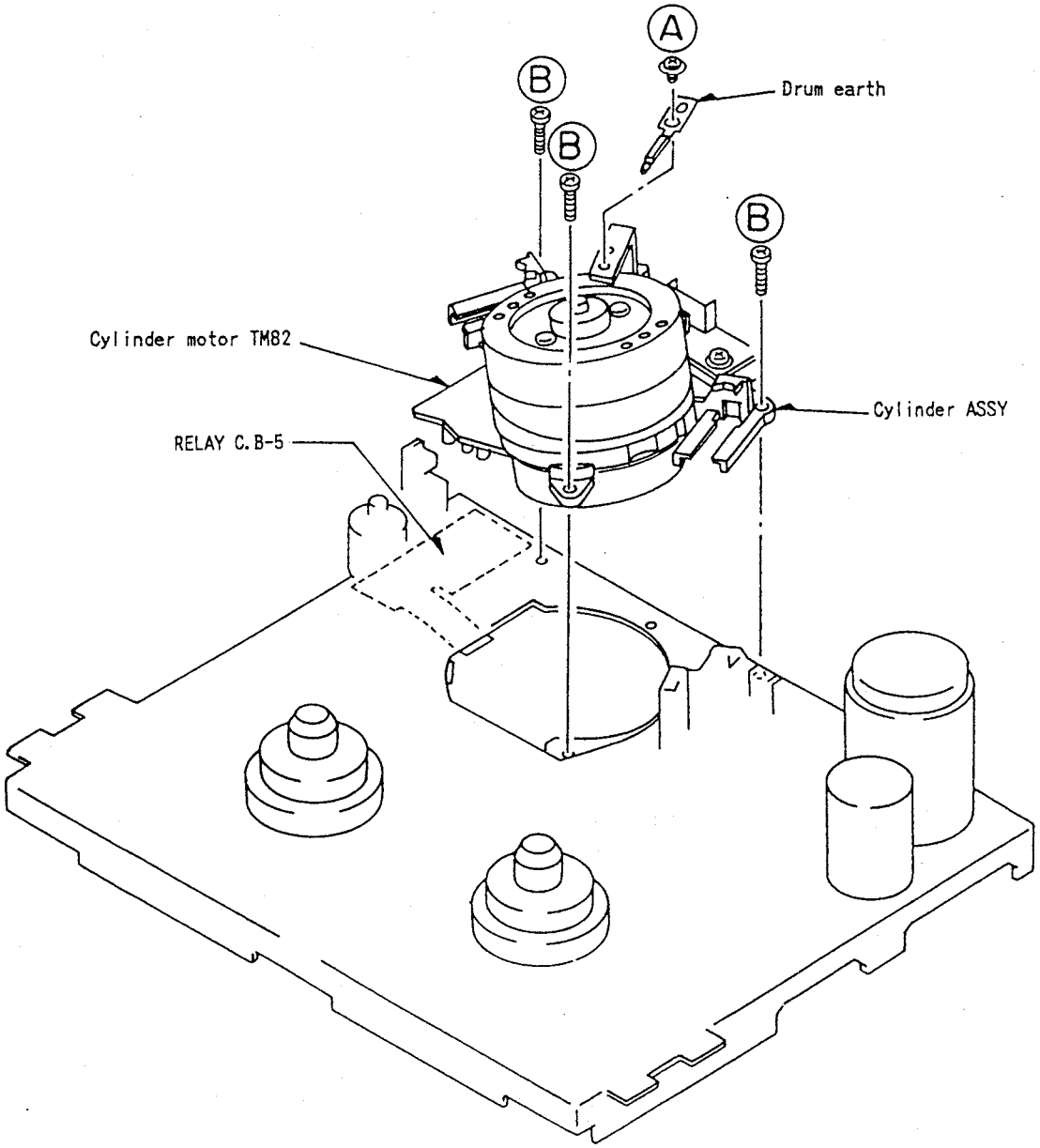


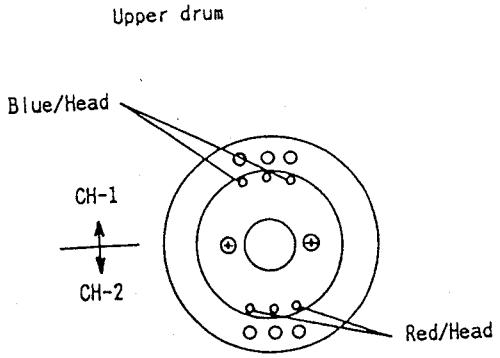
Fig-10

12. "UPPER DRUM" REMOVAL (See Figure-11)

1) Remove the "Front loading ASSY".
2) Remove 1 screw (A) and take off the "Drum earth bracket".
3) Remove 2 screws (B) and take off the "Upper drum".

≡Remark≡

1. Use gloves and do not touch the drum surface with bare fingers.
2. If the Video head is defective, replace the complete "Upper drum" with the Head.



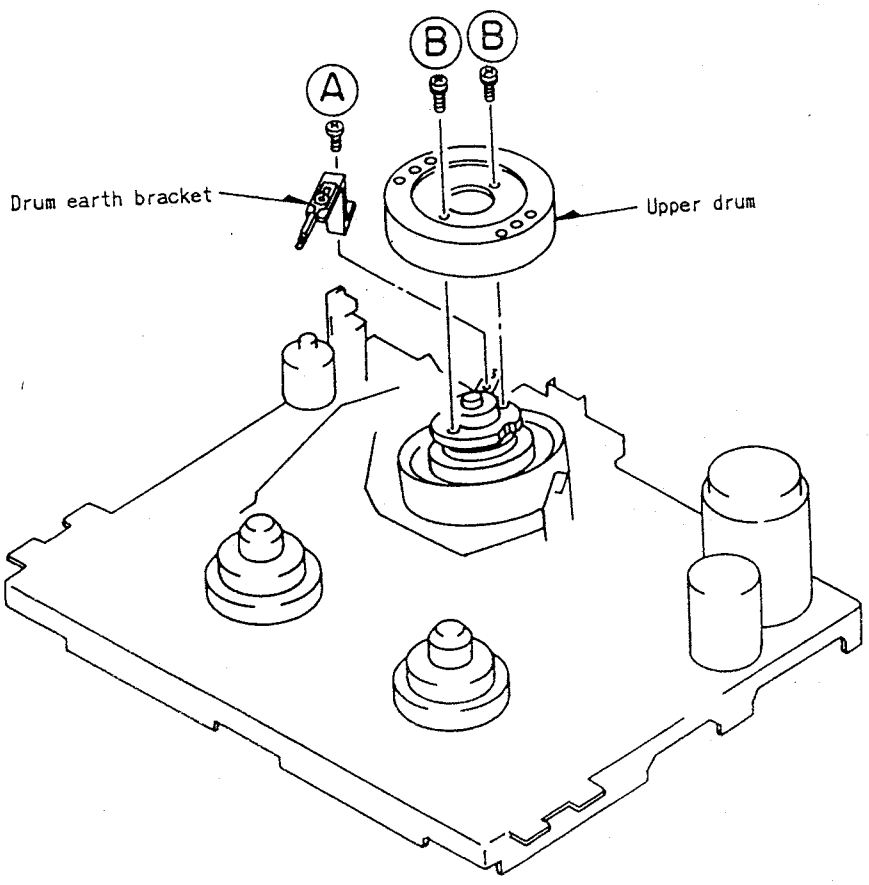


Fig-11

13. "CYLINDER MOTOR" REMOVAL (See Figure-12)

1) Pull out the "RELAY C.B-5" from the "Cylinder motor TM82".
2) Remove 2 screws (A) and take off the "Cylinder motor TM82".
3) Remvoe 3 screws (B) and take off the "Cylinder motor TM82".

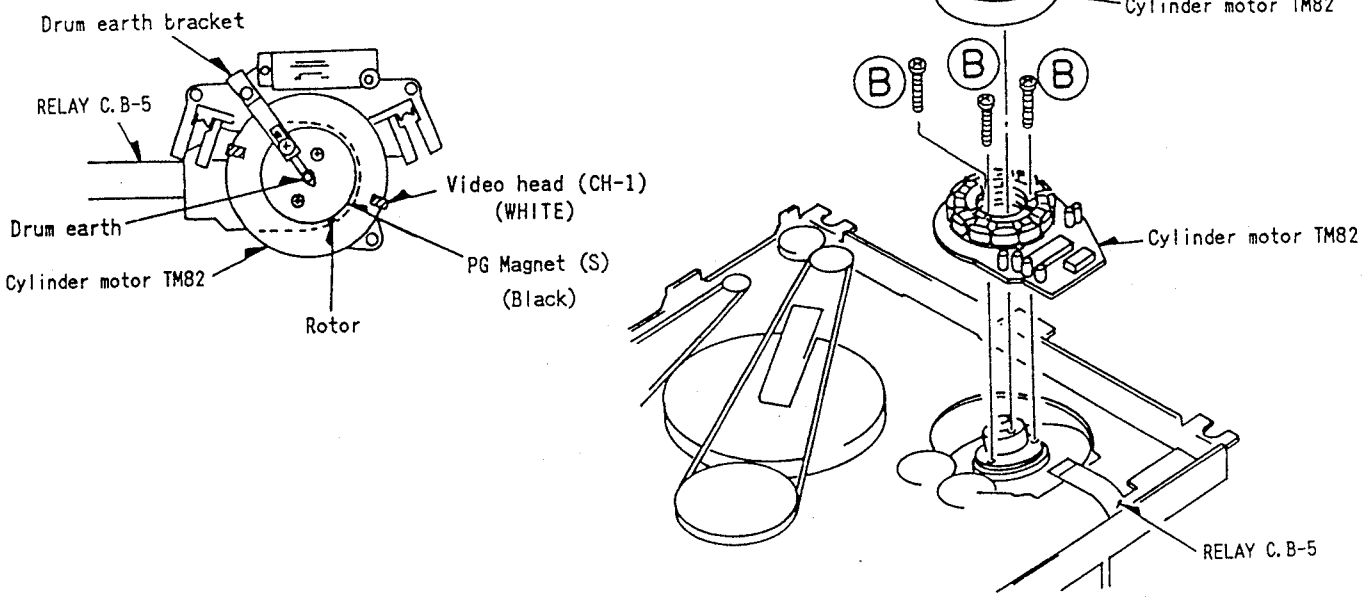


Fig-12

14. "CAPSTAN MOTOR ASSY" AND "LOADING MOTOR ASSY" REMOVAL (See Figure-13)

1. "Capstan Motor ASSY" Removal
   1) Take off the "Drive belt" and "Main belt".
   2) Remove 2 screws (A) and take off the "Capstan motor ASSY".
2. "LOADING MOTOR ASSY" Removal
   1) Take off the "FL belt".
   2) Remove 2 screws (B) and take off the "Loading motor ASSY".

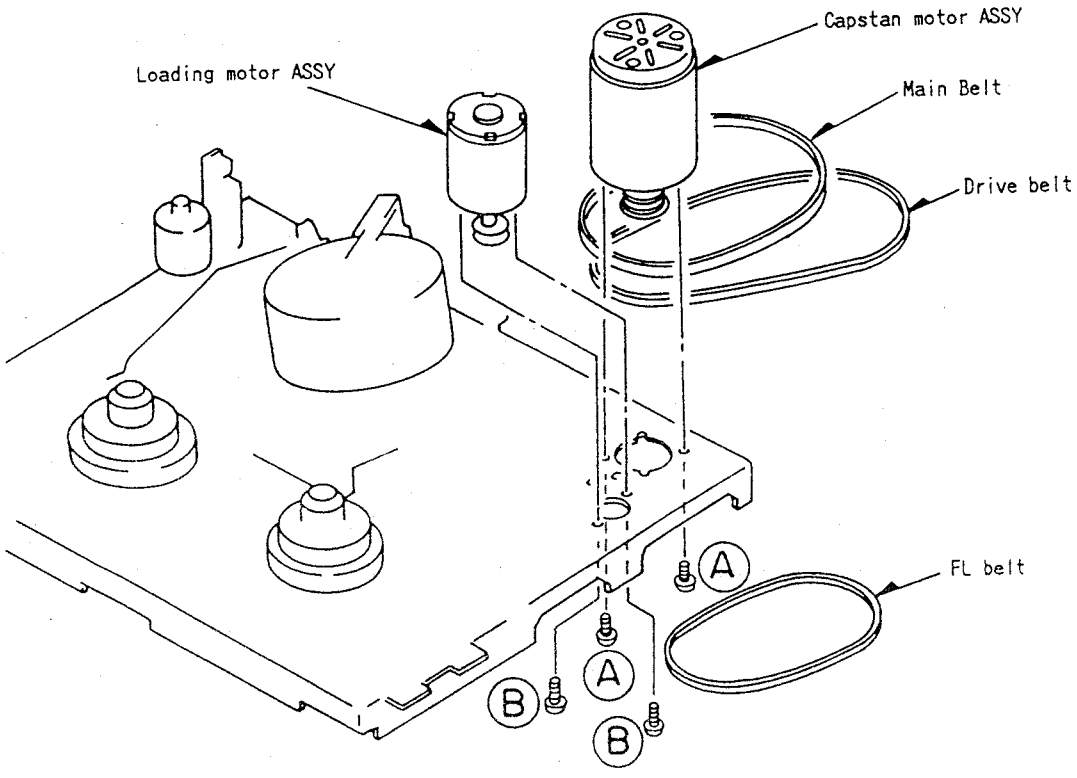


Fig-13

15. "LOADING GEAR" AND "LOADING CAM ASSY" REMOVAL (See Figure-14)

1) Take off the "Loading belt" from the "Loading pulley".
2) Remove Poly-Washer(A)and take off the "Loading pulley".
3) Remove Poly-Washer(B)and take off the "Loading gear".
4) Remove Poly-Washer(C)and take off the "Eject arm" and the "Brake actuate arm".
5) Remvoe 2 screws (D), and take off the "Loading lever reinforce plate" and the "Loading lever ASSY".
6) Take off the "Loading cam ASSY".

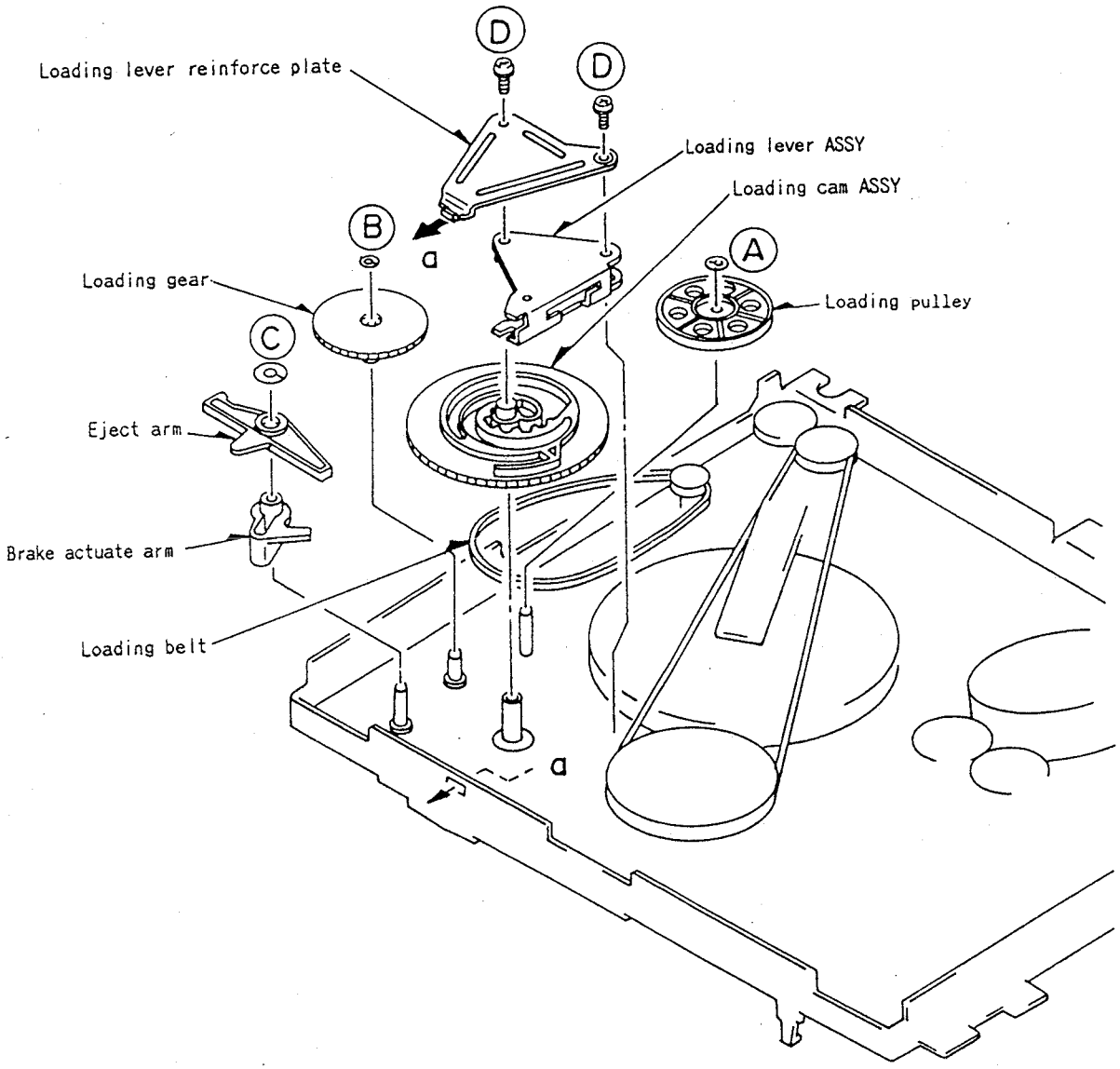


Fig-14

16. "FLYWHEEL CAPSTAN" REMOVAL (See Figure-15)

1) Remove the Nylon-Washer (A).
2) Take off the "Drive belt" and "Main belt".
3) Remove 2 screws (B) and take off the "FL angle ASSY".
4) Take off the "Flywheel capstan".

≡Remark≡

Do not miss the Poly-Washer (C) when pulling out the "Flywheel capstan".

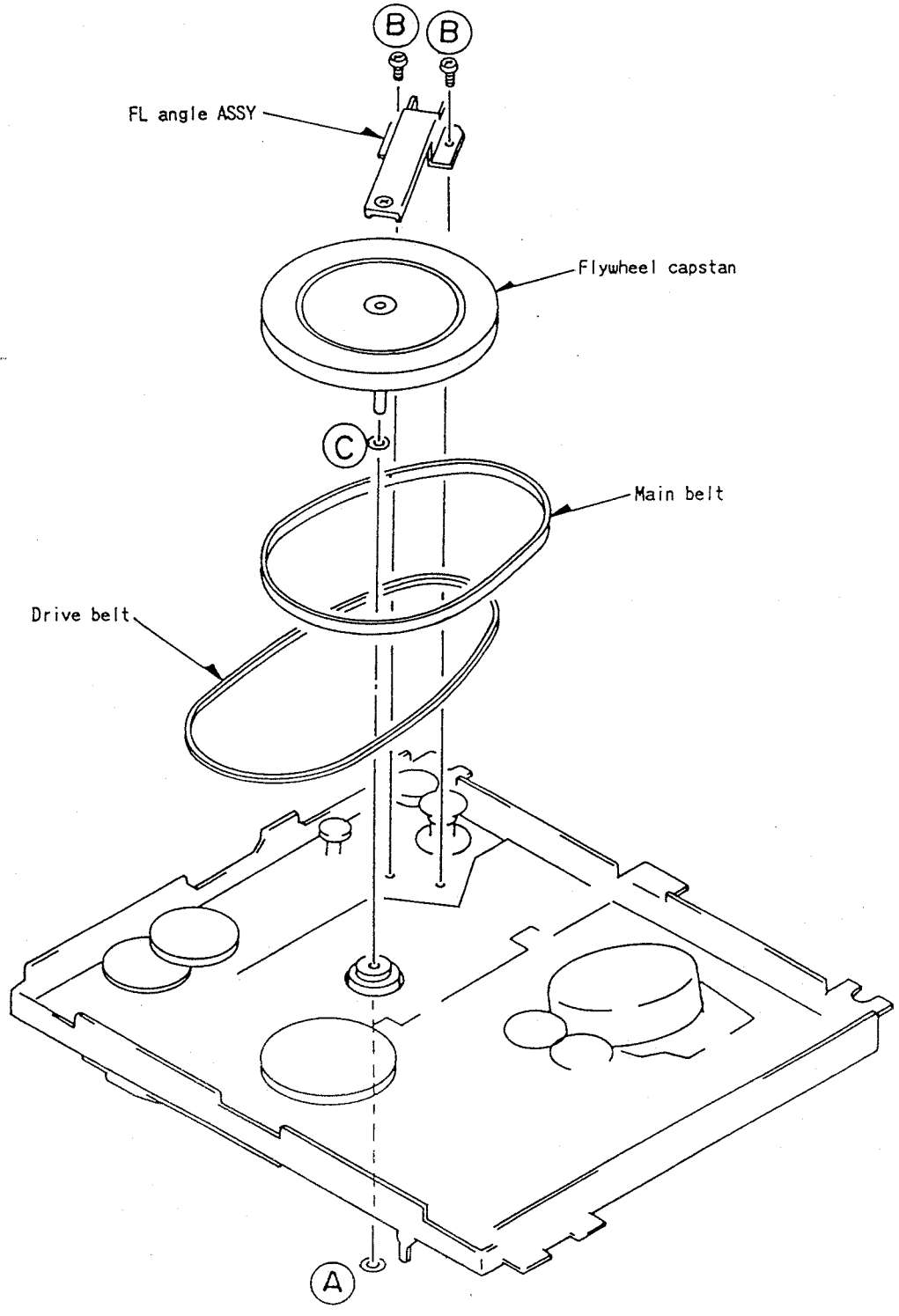


Fig-15

17. "REEL SENSOR" REMOVAL (See Figure-16)

1. Remove "Front loading ASSY" and the "Gear holder ASSY".
2. Remove "Reel ASSY".
3. Remove "Reel sensor".

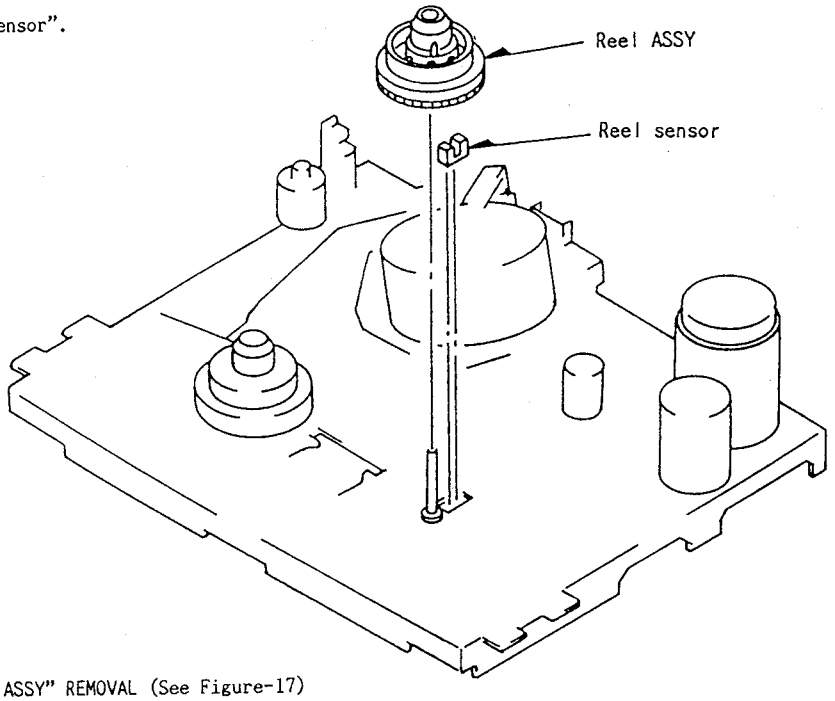


Fig-16

18. "LOADING BASE SEMI ASSY" REMOVAL (See Figure-17)

1) Remove "Cylinder ASSY", "BT arm semi ASSY", "BT band ASSY" and "Front loading ASSY".
2) Remove 1 screw (A) and "L gear plate collar", "L gear plate".
3) Remove 2 screws (B).
4) Take off the "Loading base semi ASSY".

≡Remark≡

When installing the "L gear plate", align markings (C) on the "T loading gear L" and "L gear plate".

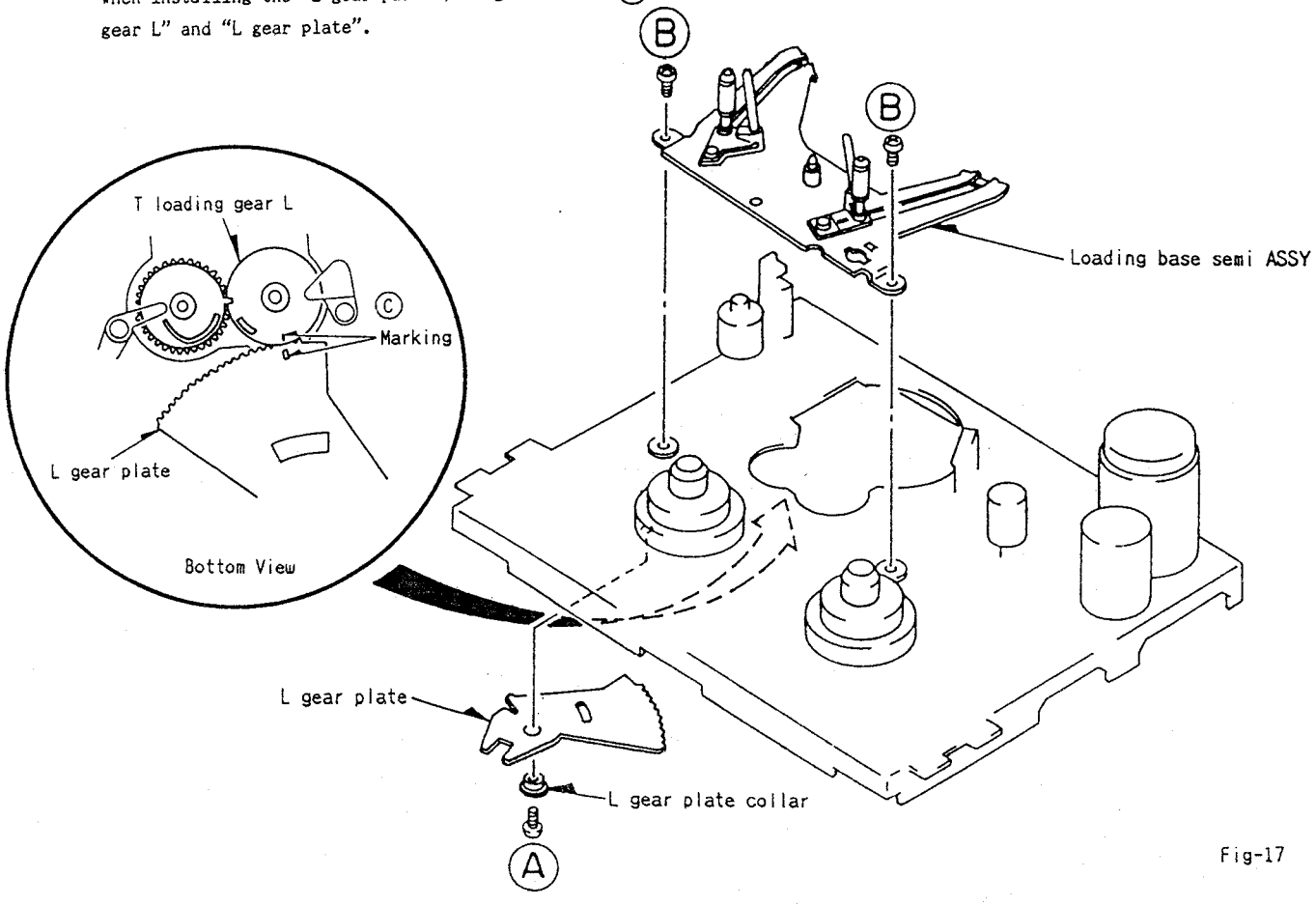


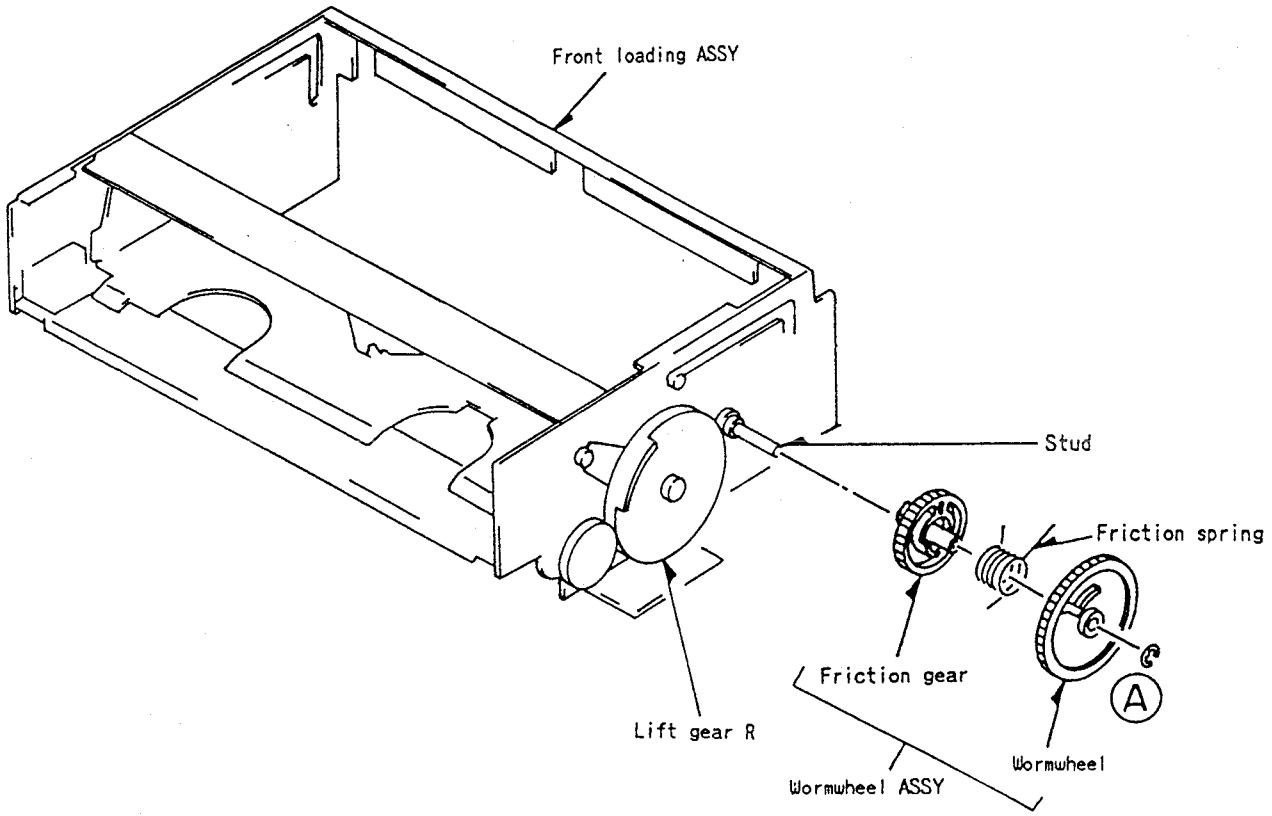
Fig-17

19. "WORMWHEEL ASSY" REMOVAL (See Figure-18)

1. Disassembly
   1) Remove "Front loading ASSY".
   2) Remove E-Ring (A).
   3) Remove "Wormwheel ASSY". ("Wormwheel", "Friction spring", "Friction gear")
2. Assembly
   1) Turn the "Lift gear R" fully couterclockwise.
   2) Restore "Wormwheel ASSY" to the stud.

≡Remark≡

Match "Lift gear R" to the "Wormwheel hole" as illustrated.



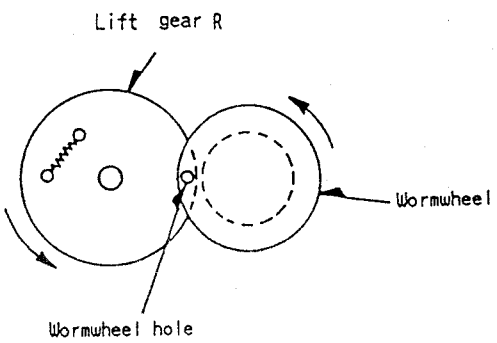


Fig-18

ELECTRICAL MAIN PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
=== IC ===		
	S0-051-C02-010	IC,AN1431T-TA
	S0-051-C02-030	IC,AN78L05A
	S0-051-C02-040	IC,AN78M05R
	87-001-853-010	IC,BA6209-V3
	87-001-777-010	IC,BA6219B
	87-001-829-010	IC,BA7025L
	87-001-775-010	IC,BA7767AS
	89-JU7-615-010	IC,HD404302A06P (HV-DK510MK2 ONLY)
	87-001-774-010	IC,LA7320
	87-001-773-010	IC,LA7323
	87-001-784-010	IC,LA7331N
	87-020-396-010	IC,LA7910
	87-001-771-010	IC,LC8992
	87-001-855-010	IC,LVA522S
	87-020-096-010	IC,M4066BP
	87-001-180-010	IC,M5223L
	S0-05H-IC1-010	IC,MA2830 F4005
	89-JU5-637-010	IC,MB88525-205M
	89-JU7-614-010	IC,MN67481P
	89-JU5-649-010	IC,MSM16811
	87-001-858-010	IC,PQ09R05
	87-020-923-010	IC,PST523D
	87-001-790-010	IC,SBX1610-52 UNIT(REMOTE SENSOR)
	87-027-564-010	IC,TC4011BP
	87-027-327-010	IC,UPC574J
	89-JU5-650-010	IC,UPD1730CT
	89-JU5-625-010	IC,UPD75208CW-A25
=== TRANSISTOR ===		
	87-026-452-010	TRANSISTOR,2SA933S
	87-026-463-010	TRANSISTOR,2SA933SR
	89-110-484-010	TRANSISTOR,2SA1048Y
	89-207-333-010	TRANSISTOR,2SB733K3
	87-026-462-010	TRANSISTOR,2SC1740SR
	89-320-026-010	TRANSISTOR,2SC2002
	89-339-406-010	TRANSISTOR,2SC3940A
	S0-05Q-003-010	TRANSISTOR,2SC4148
	87-026-219-010	TRANSISTOR,DTA144ES
	87-026-218-010	TRANSISTOR,DTC144ES
	S0-05Q-002-020	TRANSISTOR,UN4211
=== DIODE ===		
	87-020-465-010	DIODE,1SS133
	87-020-752-010	DIODE,1SS270A-TD
	S0-05D-002-030	DIODE,D1NL-20-4070
	S0-05D-001-010	DIODE,S1WBA60
	S0-05D-002-010	DIODE,S3LA20-04P16
	87-020-511-010	DIODE,ZENER 05Z4.7Y
	87-027-584-010	DIODE,ZENER HZ9C1L
	87-027-171-010	DIODE,ZENER RD2.7ESB2
	S0-05D-002-050	DIODE,ZENER RD24F-B2-T7
	S0-05D-003-040	DIODE,ZENER RD47EB
	S0-05D-001-030	DIODE,ZENER RD6.2F-B2-T7
	SU-S10-40M-000	DIODE,US1040M
=== MAIN CIRCUIT BOARD SECTION ===		
C401	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C402	*87-010-263-010	CAP,ELECT 100-10
C403	*87-010-405-010	CAP,ELECT 10-50 SME
C404	*87-010-405-010	CAP,ELECT 10-50 SME
C405	*87-010-405-010	CAP,ELECT 10-50 SME
C411	*87-010-263-010	CAP,ELECT 100-10
C412	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C413	*87-010-405-010	CAP,ELECT 10-50 SME
C416	*87-010-615-010	CAP,ELECT 2.2-50BP
C417	*87-010-400-010	CAP,ELECT 0.47-50 SME
C418	*87-018-106-010	CAP,CERA-SOL SS 15P-50 SL
C420	*87-018-126-010	CAP,CERA-SOL SS 390P-50 B
C421	*87-018-143-010	CAP,CERA-SOL SS 4.7P-50 CH
C422	*87-010-263-010	CAP,ELECT 100-10
C423	*87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C424	*87-010-401-010	CAP,ELECT 1-50 SME
C425	*87-010-404-010	CAP,ELECT 4.7-50 SME
C426	*87-010-546-010	CAP,ELECT 0.33-50 SME
C427	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C428	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C429	*87-018-110-010	CAP,CERA-SOL SS 24P-50 SL
C430	*87-018-118-010	CAP,CERA-SOL SS 82P-50 B
C431	*87-018-110-010	CAP,CERA-SOL SS 24P-50 SL
C432	*87-010-402-010	CAP,ELECT 2.2-50 SME
C434	*87-018-120-010	CAP,CERA-SOL SS 120P-50 B
C435	*87-018-104-010	CAP,CERA-SOL SS 10P-50 SL
C436	*87-018-116-010	CAP,CERA-SOL SS 56P-50 SL
C437	*87-018-131-010	CAP,CERA-SOL SS 1000P-50 B
C438	*87-018-133-010	CAP,CERA-SOL SS 4700P-16 X
C439	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C440	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C441	*87-010-402-010	CAP,ELECT 2.2-50 SME
C442	*87-010-405-010	CAP,ELECT 10-50 SME
C443	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C444	*87-010-403-010	CAP,ELECT 3.3-50 SME
C445	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C447	*87-018-126-010	CAP,CERA-SOL SS 390P-50 B
C449	*87-018-117-010	CAP,CERA-SOL SS 68P-50 SL
C450	*87-018-121-010	CAP,CERA-SOL SS 150P-50 B
C451	*87-010-260-010	CAP,ELECT 47-25 SME
C452	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C453	*87-018-121-010	CAP,CERA-SOL SS 150P-50 B
C461	*87-010-263-010	CAP,ELECT 100-10
C462	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C463	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C464	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C465	*87-018-119-010	CAP,CERA-SOL SS 100P-50 B
C466	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C467	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C468	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C469	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C470	*87-018-119-010	CAP,CERA-SOL SS 100P-50 B
C471	*87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C472	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C473	*87-010-401-010	CAP,ELECT 1-50 SME
C474	*87-010-401-010	CAP,ELECT 1-50 SME
C475	*87-010-401-010	CAP,ELECT 1-50 SME
C476	*87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C477	*87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C479	*87-010-263-010	CAP,ELECT 100-10
C480	*87-010-401-010	CAP,ELECT 1-50 SME
C481	*87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C484	*87-018-112-010	CAP,CERA-SOL SS 30P-50 SL
C485	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C486	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C487	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C511	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C512	*87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C514	*87-010-263-010	CAP,ELECT 100-10
C515	*87-010-265-010	CAP,ELECT 33-16V

REF.NO.	PART NO.	DESCRIPTION
C520	★87-018-114-010	CAP,CERA-SOL SS 39P-50 SL
C516	★87-010-263-010	CAP,ELECT 100-10
C551	★87-010-371-010	CAP,ELECT 470-6.3
C552	★87-010-405-010	CAP,ELECT 10-50 SME
C581	★87-010-405-010	CAP,ELECT 10-50 SME
C582	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C583	★87-010-263-010	CAP,ELECT 100-10
C584	★87-010-405-010	CAP,ELECT 10-50 SME
C585	★87-010-405-010	CAP,ELECT 10-50 SME
C586	★87-018-125-010	CAP,CERA-SOL SS 330P-50 B
C587	★87-018-125-010	CAP,CERA-SOL SS 330P-50 B
C801	★87-010-404-010	CAP,ELECT 4.7-50 SME
C803	★87-010-404-010	CAP,ELECT 4.7-50 SME
C804	★87-010-405-010	CAP,ELECT 10-50 SME
C805	★87-010-404-010	CAP,ELECT 4.7-50 SME
C806	★87-010-402-010	CAP,ELECT 2.2-50 SME
C807	★87-010-381-010	CAP,ELECT 330-16 SME
C808	★87-010-265-010	CAP,ELECT 33-16 SME
C812	★87-018-127-010	CAP,CERA-SOL SS 470P-50 B
C813	★87-010-408-010	CAP,ELECT 47-50
C814	★87-010-791-010	CAP,ELECT 33-63 SME
C815	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C816	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C817	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C818	★87-018-196-010	CAP,CERA-SOL SS 1500P-16X
C819	★87-010-545-010	CAP,ELECT 0.22-50 SME
C820	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C821	★87-010-384-010	CAP,ELECT 100-25 SME
C822	★87-010-402-010	CAP,ELECT 2.2-50 SME
C838	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C840	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C841	★87-010-384-010	CAP,ELECT 100-25 SME
C842	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C843	★87-010-260-010	CAP,ELECT 47-25 SME
C844	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C845	★87-010-405-010	CAP,ELECT 10-50 SME
C852	★87-018-115-010	CAP,CERA-SOL SS 47P-50SL
C881	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C882	★87-010-384-010	CAP,ELECT 100-25 SME
C883	★87-010-381-010	CAP,ELECT 330-16 SME
C884	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C885	★87-010-405-010	CAP,ELECT 10-50 SME
C889	★87-010-260-010	CAP,ELECT 47-25 SME
C890	★87-010-403-010	CAP,ELECT 3.3-50 SME
C891	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C892	★87-010-384-010	CAP,ELECT 100-25 SME
DL461	★89-JU8-619-010	DL,EFD-JF124A13F
FIL411	★89-JU5-667-010	FILTER,LPF 3M 7YCP
FIL461	★89-JU7-644-010	FILTER,LPF 1M
FIL462	★89-JU5-666-010	FILTER,AC-7 4.43M
FIL463	★87-008-416-010	FILTER,SFS 5.06ME
FIL511	★89-JU5-663-010	FILTER,SFE4.5MB
J401	89-JU7-646-010	JACK PIN 2-2(AUDIO/VIDEO IN)
J402	89-JU7-646-010	JACK PIN 2-2(AUDIO/VIDEO OUT)
L401	★87-005-208-010	COIL,100UH
L402	★87-005-208-010	COIL,100UH
L411	★87-005-208-010	COIL,100UH
L412	★87-005-208-010	COIL,100UH
L413	★87-003-281-010	COIL,3.9UH LAL02
L415	★87-003-288-010	COIL,180UH LAL02
L416	★87-003-150-010	COIL,68UH LAL02
L417	★87-003-150-010	COIL,68UH LAL02
L461	★87-005-208-010	COIL,100UH
L462	★87-005-400-010	COIL,18UH J
L463	★87-003-142-010	COIL,3.3UH LAL02
L464	★87-003-284-010	COIL,27UH LAL02
L511	★82-132-631-010	COIL,4.7MMH,J
L801	★87-005-208-010	COIL,100UH
L809	★87-005-208-010	COIL,100UH
L810	★87-005-208-010	COIL,100UH
L811	★87-005-208-010	COIL,100UH
L812	★87-005-204-010	COIL,47UH
L814	★87-005-208-010	COIL,100UH
RF801	89-JU5-676-010	RF MOD,E283A
SFR411	★87-024-172-010	SFR,10K
SFR412	★87-024-172-010	SFR,10K
SFR413	★87-024-172-010	SFR,10K
SFR414	★87-024-168-010	SFR,1K
SFR415	★87-024-168-010	SFR,1K
SFR416	★87-024-170-010	SFR,3.3K
SFR461	★87-024-168-010	SFR,1K
SFR801	★87-024-170-010	SFR,3.3K
TU801	89-JU5-653-010	TV TU,F4EH-721
VIF801	89-JU5-673-010	VIF PACK,VNA102M
X461	★89-JU7-641-010	XTAL RESONATOR 4.43M
X801	★87-030-188-010	CERAMIC RESONATOR 4.5MGW

=== SERVO/SYSCON CIRCUIT BOARD SECTION ===

C201	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C202	★87-010-263-010	CAP,ELECT 100-10
C204	★87-010-401-010	CAP,ELECT 1-50 SME
C205	★87-010-374-010	CAP,ELECT 47-10
C206	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C207	★87-010-405-010	CAP,ELECT 10-50 SME
C208	★87-010-615-010	CAP,ELECT 2.2-50 BP
C209	★87-010-405-010	CAP,ELECT 10-50 SME
C210	★87-010-405-010	CAP,ELECT 10-50 SME
C211	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C212	★87-010-401-010	CAP,ELECT 1-50 SME
C213	★87-010-401-010	CAP,ELECT 1-50 SME
C214	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C215	★87-010-401-010	CAP,ELECT 1-50 SME
C216	★87-010-401-010	CAP,ELECT 1-50 SME
C217	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C218	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C219	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C220	★87-010-263-010	CAP,ELECT 100-10
C221	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C222	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C223	★87-010-265-010	CAP,ELECT 33-16 SME
C224	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C225	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C226	★87-010-545-010	CAP,ELECT 0.22-50 SME
C227	★87-010-263-010	CAP,ELECT 100-10
C228	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C229	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C230	★87-018-209-010	CAP,CERA-SOL SS 0.1-50 F
C231	★87-018-209-010	CAP,CERA-SOL SS 0.1-50 F
C232	★87-018-209-010	CAP,CERA-SOL SS 0.1-50 F
C233	★87-010-384-010	CAP,ELECT 100-25 SME
C234	★87-018-209-010	CAP,CERA-SOL SS 0.1-50 F
C235	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C236	★87-010-263-010	CAP,ELECT 100-10
C237	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C238	★87-010-263-010	CAP,ELECT 100-10 (HV-DK510MK2 ONLY)
C239	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y (HV-DK510MK2 ONLY)

REF.NO.	PART NO.	DESCRIPTION
C241	★87-010-405-010	CAP,ELECT 10-50 SME (HV-DK510MK2 ONLY)
C243	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C244	★87-018-209-010	CAP,CERA-SOL SS 0.1-50 F
C245	★87-010-384-010	CAP,ELECT 100-25 SME
C246	★87-010-544-010	CAP,ELECT 0.1-50 (HV-DK510MK2 ONLY)
C247	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C248	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
L201	★87-005-204-010	COIL,47UH
L202	★87-005-204-010	COIL,47UH (HV-DK510MK2 ONLY)
L203	★87-006-189-010	COIL,220UH EL0909
L204	★87-006-189-010	COIL,220UH EL0909
⚠R254	★87-029-082-010	RES,FUSE 100-1/4W
⚠R266	★87-029-361-010	RES,FUSE 3.3-1/2W
⚠R282	★87-029-361-010	RES,FUSE 3.3-1/2W
SFR201	★87-024-277-010	SFR,220K
SFR202	★87-024-277-010	SFR,220K
X201	★87-030-185-010	CERAMIC RESONATOR KBR6.0MES
X202	★87-030-179-010	CERAMIC RESONATOR KBR-4.0MES (HV-DK510MK2 ONLY)

=== PRE AMP/AUDIO CIRCUIT BOARD SECTION ===

C601	★87-010-248-010	CAP,ELECT 220-10 SME
C602	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C603	★87-010-260-010	CAP,ELECT 47-25 SME
C604	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C606	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C610	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C611	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C612	★87-015-695-010	CAP,ELECT 1-50
C613	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C614	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C615	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C616	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C617	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C618	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C630	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C631	★87-018-115-010	CAP,CERA-SOL SS 47P-50 SL
C632	★87-018-120-010	CAP,CERA-SOL SS 120P-50 B
C633	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C634	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C636	★87-018-120-010	CAP,CERA-SOL SS 120P-50 B
C637	★87-018-125-010	CAP,CERA-SOL SS 330P-50 B
C702	★87-018-123-010	CAP,CERA-SOL SS 220P-50 B
C703	★87-015-684-010	CAP,ELECT 47-16
C704	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C705	★87-018-134-010	CAP,CERA-SOL SS 0.01-16 Y
C706	★87-015-687-010	CAP,ELECT 33-25
C707	★87-010-384-010	CAP,ELECT 100-25 SME
C708	★87-018-205-010	CAP,CERA-SOL SS 0.022-25 F
C709	★87-010-403-010	CAP,ELECT 3.3-50 SME
C710	★87-010-404-010	CAP,ELECT 4.7-50 SME
C712	★87-010-402-010	CAP,ELECT 2.2-50 SME
C717	★87-018-197-010	CAP,CERA-SOL SS 1800P-16 X
C718	★87-010-404-010	CAP,ELECT 4.7-50 SME
C719	★87-018-119-010	CAP,CERA-SOL SS 100P-50 B
C720	★87-010-382-010	CAP,ELECT 22-25 SME
C722	★87-015-695-010	CAP,ELECT 1-50
C723	★87-018-133-010	CAP,CERA-SOL SS 4700P-16 X
C724	★87-018-131-010	CAP,CERA-SOL SS 1000P-50 B
C725	★87-015-676-010	CAP,ELECT 47-6.3
C726	★87-015-695-010	CAP,ELECT 1-50
C727	★87-018-209-010	CAP,CREA-SOL SS 0.1-50 F
C732	★87-018-209-010	CAP,CREA-SOL SS 0.1-50 F
C734	★87-018-133-010	CAP,CERA-SOL SS 4700P-16 X
L601	★87-005-196-010	COIL,10UH
L602	★87-005-208-010	COIL,100UH
L630	★87-003-149-010	COIL,47UH
L631	★87-003-403-010	COIL,5.6UH LAL02
L633	★87-003-146-010	COIL,15UH LAL02
L634	★87-003-288-010	COIL,180UH LAL02
L701	★89-JU8-609-010	COIL,18MMH
L702	★87-003-152-010	COIL,100UH
SFR701	★87-024-275-010	SFR,47K
T701	★89-JU8-610-010	COIL,OSC BIAS-70K

=== TIMER CIRCUIT BOARD SECTION ===

C901	★87-015-682-010	CAP,ELECT 22-16
C902	★87-015-682-010	CAP,ELECT 22-16
C903	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C904	★87-015-682-010	CAP,ELECT 22-16
C905	★87-018-208-010	CAP,CERA-SOL SS 0.047-50 F
C907	★87-015-687-010	CAP,ELECT 33-25
C909	★87-018-148-010	CAP,CERA-SOL SS 12P-50 CH
D939	87-001-824-010	LED LT3S47B(AUTO TRACKING) (HV-DK510MK2 ONLY)
FL901	89-JU5-621-010	FL,9-LT-20GK(DISPLAY)
J901	★87-009-206-010	PIN JACK(AUDIO/VIDEO IN)
L901	★87-003-152-010	COIL,100UH
L902	★87-003-152-010	COIL,100UH
RV901	87-024-225-010	VR,250KB(TRACKING)
RV902	87-024-224-010	VR,10KB(PICTURE)
SW902	87-036-186-010	TACT SW(EJECT)
SW903	87-036-186-010	TACT SW(STOP)
SW904	87-036-186-010	TACT SW(PLAY)
SW905	87-036-186-010	TACT SW(REW)
SW906	87-036-186-010	TACT SW(F.FWD)
SW907	87-036-186-010	TACT SW(NOISE CANCEL,PAUSE/STILL)
SW908	87-036-186-010	TACT SW(RECORD)
SW909	87-036-186-010	TACT SW(QTR)
SW910	87-036-186-010	TACT SW(TIMER REC)
SW911	87-036-186-010	TACT SW(COUNTER RESET)
SW912	87-036-186-010	TACT SW(COUNTER MEMORY)
SW914	87-036-186-010	TACT SW(CLOCK/COUNTER)
SW915	87-036-186-010	TACT SW(CHECK/PRGM)
SW916	87-036-186-010	TACT SW(NEXT)
SW917	87-036-186-010	TACT SW(CLEAR)
SW918	87-036-186-010	TACT SW(TIME SET)
SW919	87-036-186-010	TACT SW(CHANNEL UP)
SW920	87-036-186-010	TACT SW(CHANNEL DOWN)
SW921	87-036-186-010	TACT SW(RESET)
SW922	87-036-186-010	TACT SW(CH-10)
SW923	87-036-186-010	TACT SW(CH-1)
SW924	87-036-186-010	TACT SW(TUNING +)
SW925	87-036-186-010	TACT SW(TUNING -)
SW926	87-036-186-010	TACT SW(INPUT SELECT)
SW929	87-036-186-010	TACT SW(BAND)
SW930	87-036-178-010	SLIDE SW (AUTO TRACKING) (HV-DK510MK2 ONLY)
SW931	87-036-186-010	TACT SW(TEST)
X901	★87-030-184-010	CERAMIC RESONATOR KBR4.19MES
X902	★87-030-194-010	XTAL RESONATOR 32.768K5PPM

=== POWER SW CIRCUIT BOARD SECTION ===

D938	87-001-123-010	LED SLZ-981C-02(POWER)

REF.NO.	PART NO.	DESCRIPTION
SW901	87-036-186-010	TACT SW(POWER)
X903	★87-030-189-010	PIEZO RESONATOR PKM22EPP
⚠C101	S0-05C-001-010	CAP,FILM 0.22-250V
⚠F101	S0-05F-001-010	FUSE,1.6A 250V
L101	★S0-05L-001-010	COIL,18MMH 0.5A
⚠J101	S0-051-NLE-T00	AC JACK(AC)
C102	★S0-5EC-010-210	CAP,CERA 4700P-250V
C104	★S0-05C-001-040	CAP,ELECT 82-400V
C105	★S0-05C-001-050	CAP,FILM 0.047-630V
C106	★S0-05C-001-060	CAP,CERA 100P-1KV
C107	★S0-05C-001-070	CAP,ELECT 1-400V
C202	★87-010-053-010	CAP,ELECT 1-50V
C203	★S0-05C-002-030	CAP,ELECT 680-25V
C204	★87-010-050-010	CAP,ELECT 470-25V
C205	★S0-05C-002-030	CAP,ELECT 680-25V
C206	★S0-05C-002-060	CAP,ELECT 100-10V
C207	★87-010-050-010	CAP,ELECT 470-25V
C208	★87-010-235-010	CAP,ELECT 470-16V
C210	★87-010-268-010	CAP,ELECT 100-10V
C211	★87-010-268-010	CAP,ELECT 100-10V
L201	★S0-05L-002-010	COIL,40UH 1A
L202	★S0-05L-002-010	COIL,40UH 1A
PC101	S0-05P-C01-010	PHOTO COUPLER ON3171R
R101	★S0-05R-001-010	RES,WIRE WOUND 2.2 3W
R102	★S0-05R-001-020	RES,MF 47K 3W
R105	★S0-05R-001-050	RES,MFO 27 1W
R106	★S0-05R-001-060	RES,MFO 39 1W
⚠R107	★87-029-034-010	RES,FUSE 120 1/2W
R203	★87-025-306-010	RES,MF 5.6K 1/2W
R205	★87-025-403-010	RES,MF 1.5K 1/4W
R214	★87-025-245-010	RES,MFO 820 1W
SFR201	★S0-05R-V02-010	SFR,500
T101	★S0-05T-001-010	TRANSFORMER TS29K21V
C301	★87-010-050-010	CAP,ELECT 470-25V
C305	★S0-05C-003-050	CAP,ELECT 33-63V
R305	★S0-05R-003-050	RES,NF 12 1/2W
T301	★S0-05T-003-010	TRANSFORMER F5M-89057
	S8-059-010-160	UPPER DRUM(W/VIDEO HEAD)
	S8-059-013-040	LOWER DRUM ASSY
DS1	★S6-808-080-040	DEW SENSOR EYH-S10R
M1	S6-004-090-010	CYLINDER MOTOR TM82
M2	S8-059-073-020	CAPSTAN MOTOR ASSY
M3	S8-059-113-010	LOADING MOTOR ASSY
SW4	S6-401-011-510	LEAF SW(REC SAFETY)

=== RELAY CIRCUIT BOARD-1 SECTION ===

=== RELAY CIRCUIT BOARD-2 SECTION ===

=== RELAY CIRCUIT BOARD-3 SECTION ===

=== RELAY CIRCUIT BOARD-4 SECTION ===

=== BASE CIRCUIT BOARD SECTION ===

PCB-K	★S8-059-133-020	BASE PCB ASSY(W/MODE SW)
CP1	S6-808-080-030	PHOTO(REEL) SENSOR ON1385

=== RELAY CIRCUIT BOARD-5 SECTION ===

PCB-L	★S8-059-013-470	RELAY PCB-5 ASSY

=== RELAY CIRCUIT BOARD-6 SECTION ===

PCB-M	★S8-059-013-050	RELAY PCB-6 ASSY

=== SWITCH CIRCUIT BOARD SECTION ===

PCB-N	★S8-059-163-200	SWITCH PCB ASSY(W/SW1,2,3)

=== START CIRCUIT BOARD SECTION ===

PCB-O	★S8-059-163-010	SENSOR PCB RM ASSY

=== END SENSOR CIRCUIT BOARD SECTION ===

PCB-P	★S8-059-163-010	SENSOR PCB LM ASSY

=== LED CIRCUIT BOARD SECTION ===

LED1	★S8-059-133-030	LED ASSY(W/PCB-Q)

=== ACE HEAD CIRCUIT BOARD SECTION ===

ACEH	S6-204-150-080	ACE HEAD HV224206(W/PCB-R)

=== ERASE CIRCUIT BOARD SECTION ===

FEH	S6-204-150-030	FULL ERASE HEAD(W/PCB-S)

=== POWER CIRCUIT BOARD-1 SECTION ===

=== POWER CIRCUIT BOARD-2 SECTION ===

=== POWER CIRCUIT BOARD-3 SECTION ===

=== MISCELLANEOUS ===

PRACTICAL SERVICE FIGURE

Output Level
Video (Impedance) : 1.0±0.2Vp-p (75Ω±20%, Unbalance)
Audio (Impedance) : -8±3dB (Less than 3.3kΩ)
RF Modulated (Impedance): 75±3dBμV (75Ω, Unbalance)

Input Level
Video (Impedance) : 0.5V~2.0V±0.5Vp-p (75Ω±20%, Unbalance)
Audio (Impedance) : -10±3dB (More than 47kΩ)

TV channels received

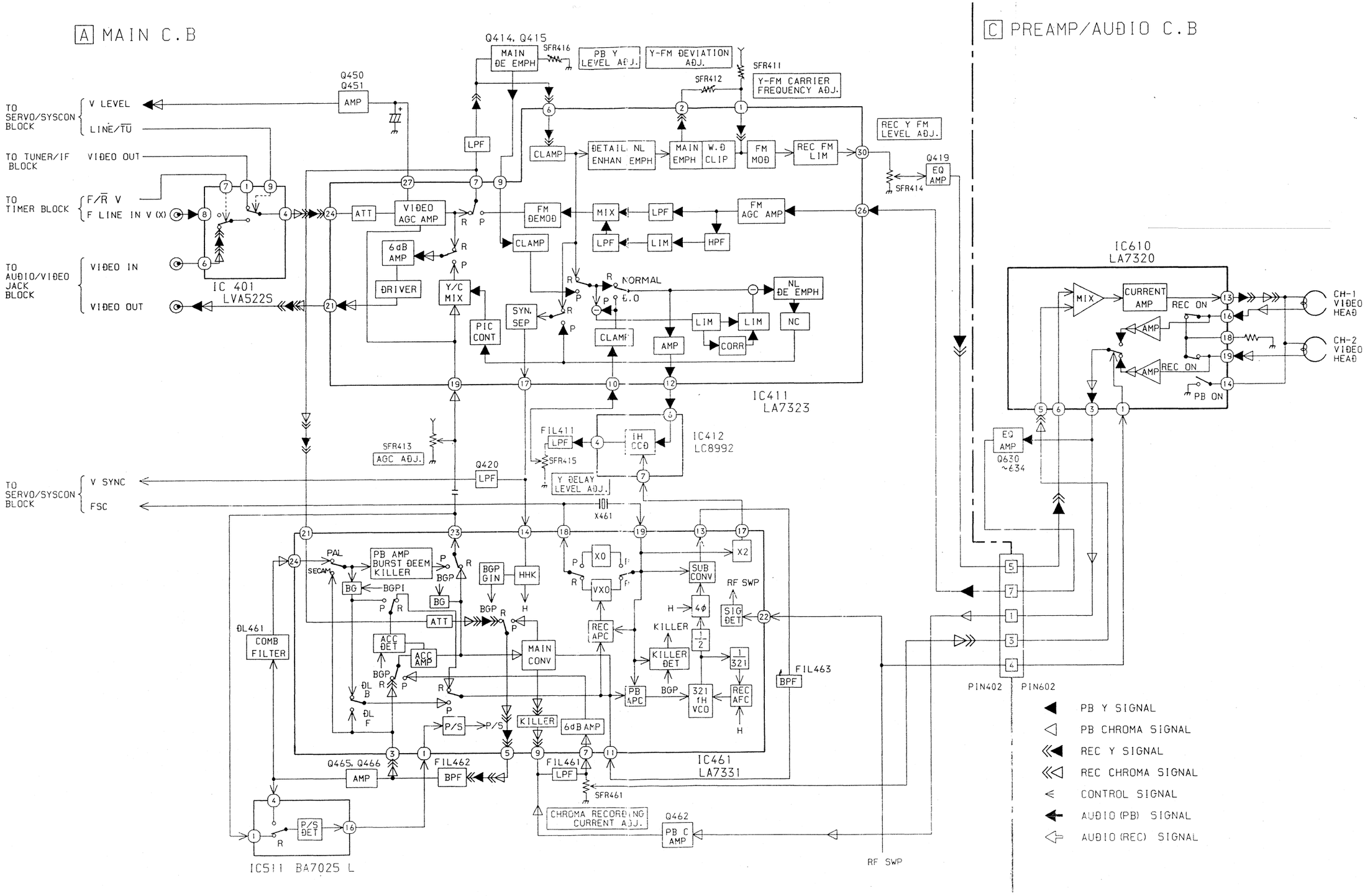
Destination	Signal format		VHF		UHF	Remarks MHz
	VHF	UHF	L	H		
	B	G	E2~E4	E5~E12	21~69	Meets FTZ Specifications VIF 38.9 SIF 33.4
	D	K	1~5	6~12	21~60	VIF 38.0 SIF 31.5

Tuner AGC : 72±3dB (VHF, UHF)

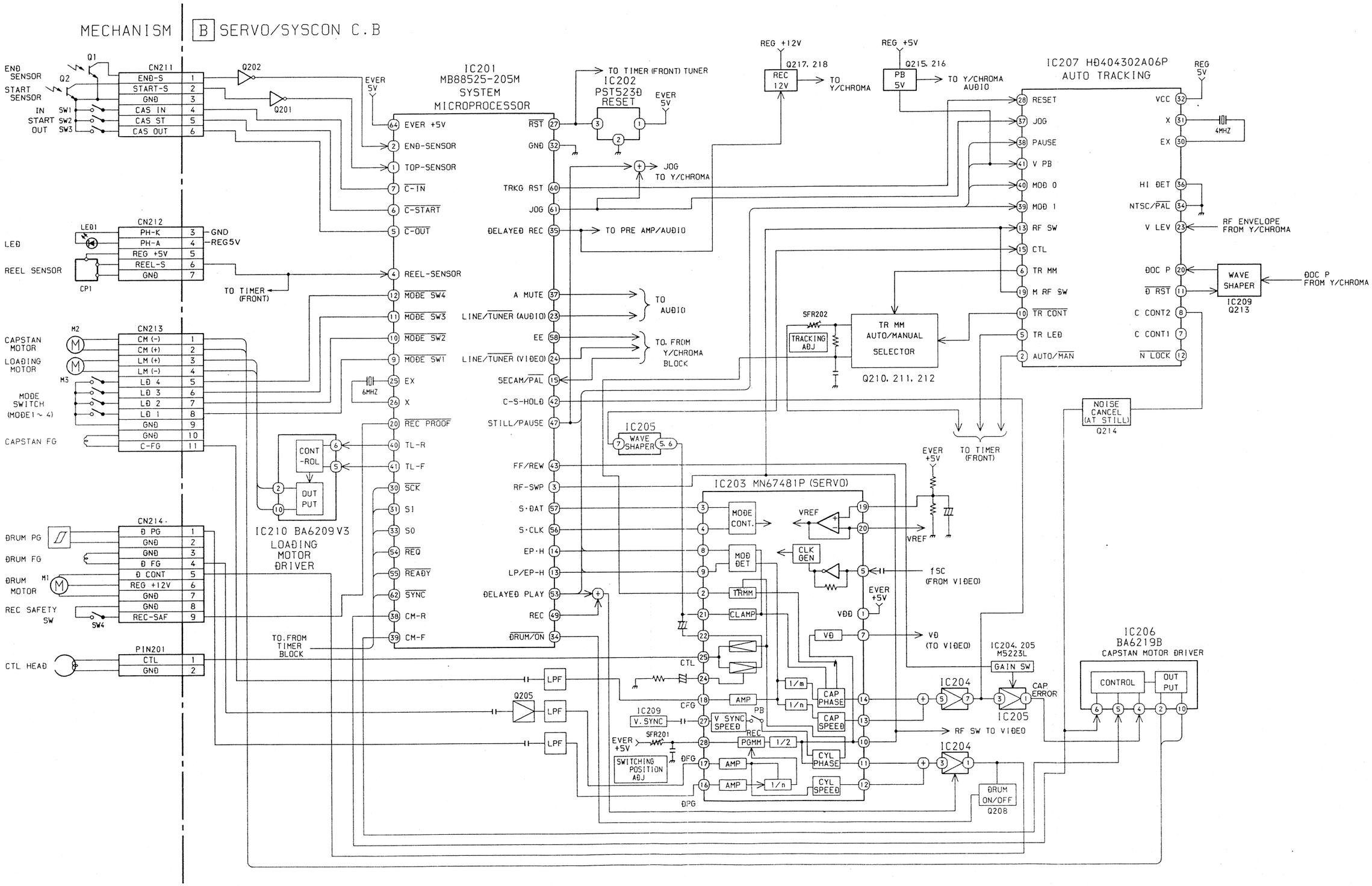
S/N Ratio
Video (SP mode) : [Test tape MVP-08(PB), MVP-09(PB), TDK HS-120(R/P)]

Signal	PB	R/P
Y-Signal	More than 42dB	More than 44.5dB
Chrominance -Signal(AM)	More than 38dB	More than 42dB
Chrominance -Signal(PM)	More than 36dB	More than 38dB

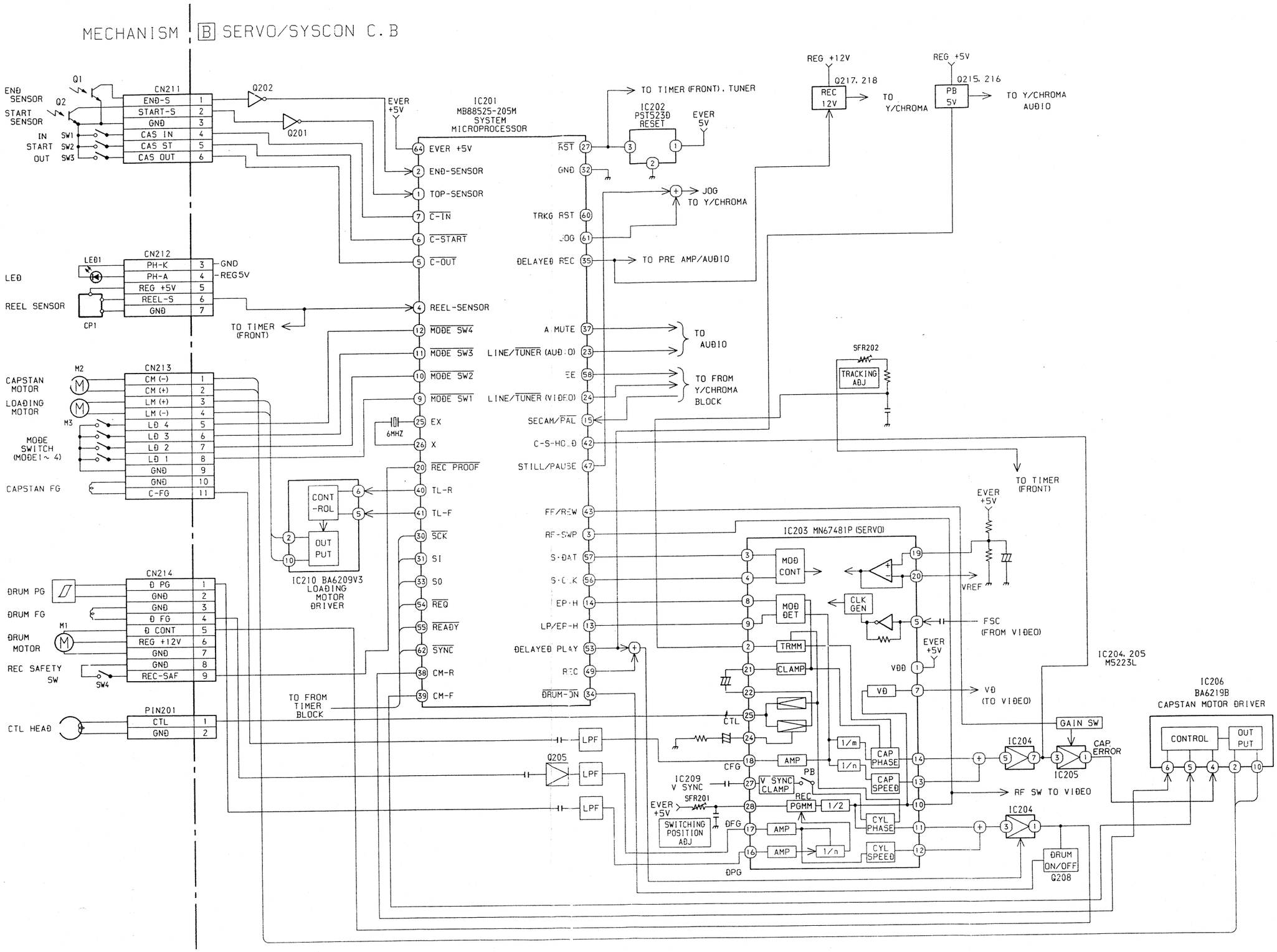
Audio (SP mode) : More than 40dB
Audio Frequency Response: 200Hz~6kHz (±4dB)
(SP mode,
Test tape A-BEX TPV-160S)
Horizontal Resolution : More than 230 lines (PB., R/P)
(Test tape TTV-06T)
Erase Ratio : More than 55dB
Bias Frequency : 70kHz±10%
Tape speed : 23.39mm/sec±0.5%
(SP mode)
Wow & Flutter : Less than 0.4%
(Test tape TTV-P5,
CCIR WTD)
F.F time : Less than 290sec (E-240)
REW time : Less than 290sec (E-240)
Back tension : 46.5±12g-cm
Loading : Less than 3sec
Unloading : Less than 3.5sec

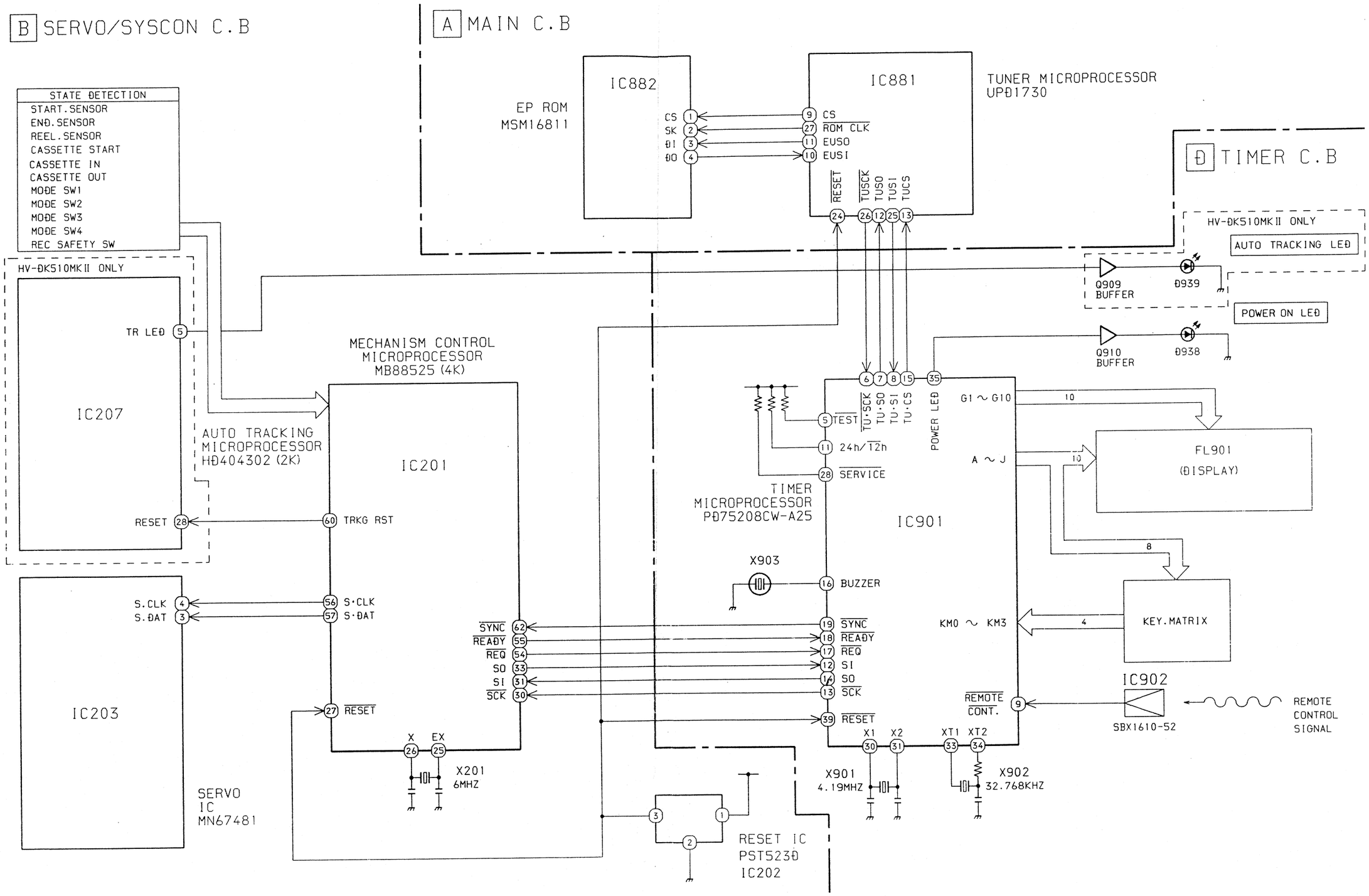

A MAIN C.B
C PREAMP/AUDIO C.B
TO SERVO/SYSCON BLOCK
V LEVEL
LINE/TU
TO TUNER/IF BLOCK
VIDEO OUT
TO TIMER BLOCK
F/R V
F LINE IN V (X)
TO AUDIO/VIDEO JACK BLOCK
VIDEO IN
VIDEO OUT
IC 401
LVA522S
Q450
Q451
AMP
LPF
CLAMP
DETAIL NL ENHAN EMPH
MAIN EMPH
W.D CLIP
FM MOD
REC FM LIM
Q414, Q415
MAIN DE EMPH
SFR416
PB Y LEVEL ADJ.
Y-FM DEVIATION ADJ.
SFR411
SFR412
Y-FM CARRIER FREQUENCY ADJ.
REC Y FM LEVEL ADJ.
Q419
EQ AMP
SFR414
ATT
VIDEO AGC AMP
FM DEMOD
MIX
FM AGC AMP
HPF
6dB AMP
DRIVER
Y/C MIX
PIC CONT
SYN. SEP
NORMAL
E.O
NL DE EMPH
NC
CORR
IC411
LA7323
FIL411
IH CCD
IC412
LC8992
SFR413
AGC ADJ.
SFR415
Y DELAY LEVEL ADJ.
Q420
X461
TO SERVO/SYSCON BLOCK
V SYNC
FSC
PAL
SECAM
PB AMP BURST DEEM KILLER
BG
BGPI
BGP GIN
HHK
XO
VXO
SUB CONV
RF SWP
SIG DET
4φ
REC APC
KILLER
KILLER DET
ACC DET
ACC AMP
MAIN CONV
PB APC
321 fH VCO
REC AFC
DL461
COMB FILTER
DL B
DL F
P/S
KILLER
6dB AMP
FIL463
BPF
Q465, Q466
AMP
FIL462
BPF
FIL461
LPF
SFR461
CHROMA RECORDING CURRENT ADJ.
Q462
PB C AMP
RF SWP
IC511 BA7025 L
IC610
LA7320
MIX
CURRENT AMP
REC ON
PB ON
CH-1 VIDEO HEAD
CH-2 VIDEO HEAD
EQ AMP
Q630 ~634
PIN402
PIN602
PB Y SIGNAL
PB CHROMA SIGNAL
REC Y SIGNAL
REC CHROMA SIGNAL
CONTROL SIGNAL
AUDIO (PB) SIGNAL
AUDIO (REC) SIGNAL

BLOCK DIAGRAM — 2 (SERVO/SYSCON, HV — DK510MK II)

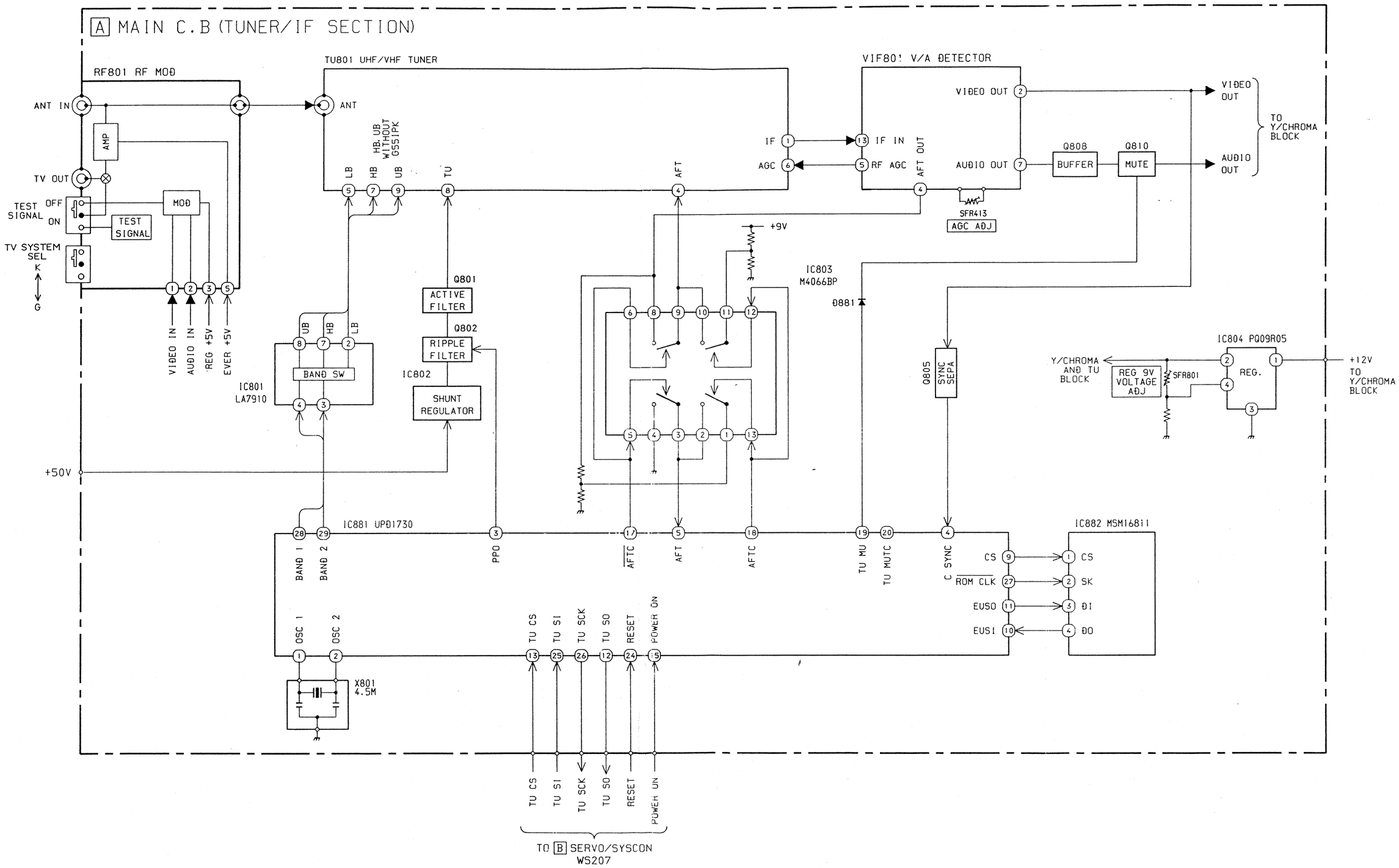


BLOCK DIAGRAM — 3 (SERVO/SYSCON, HV — DK910MK II)

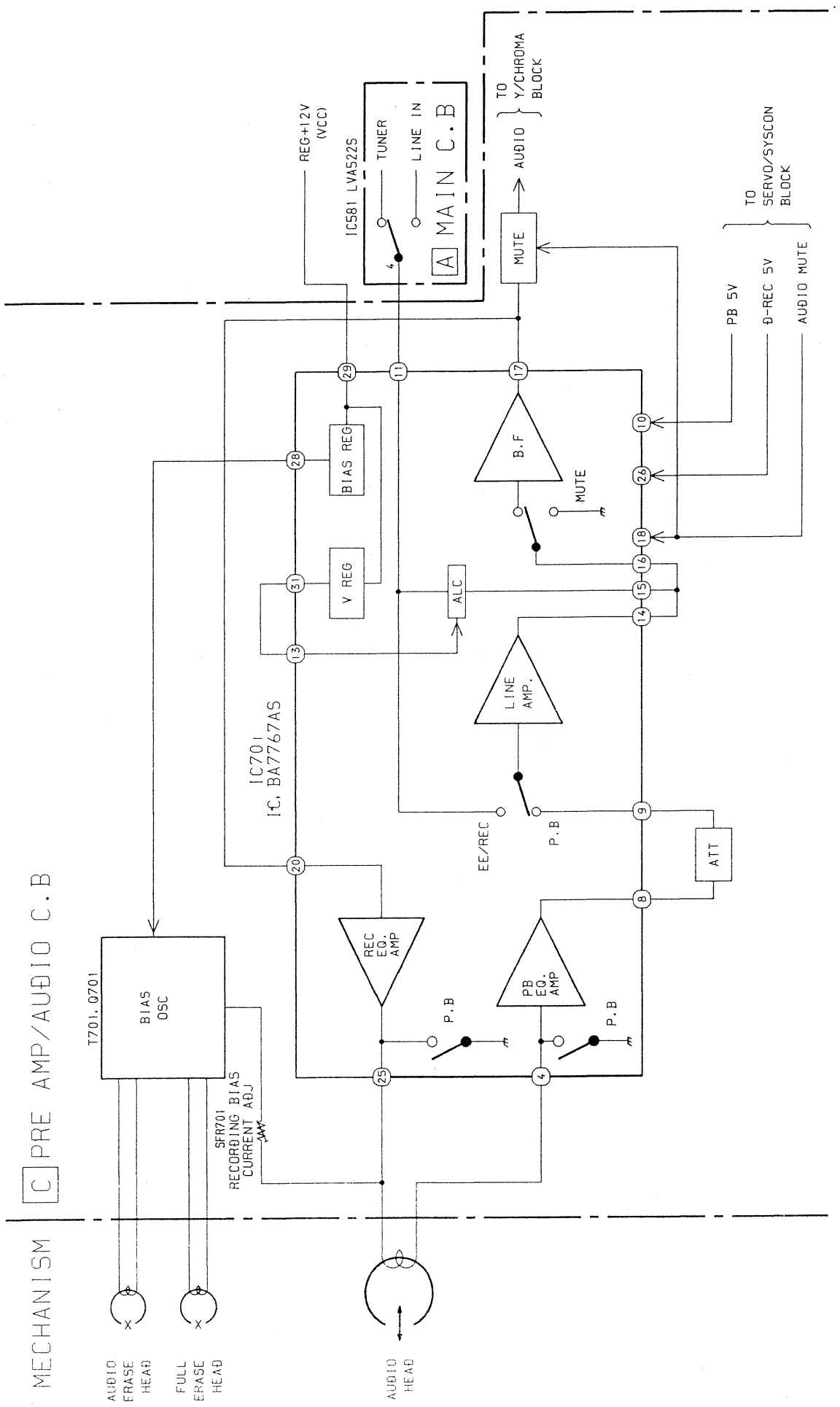


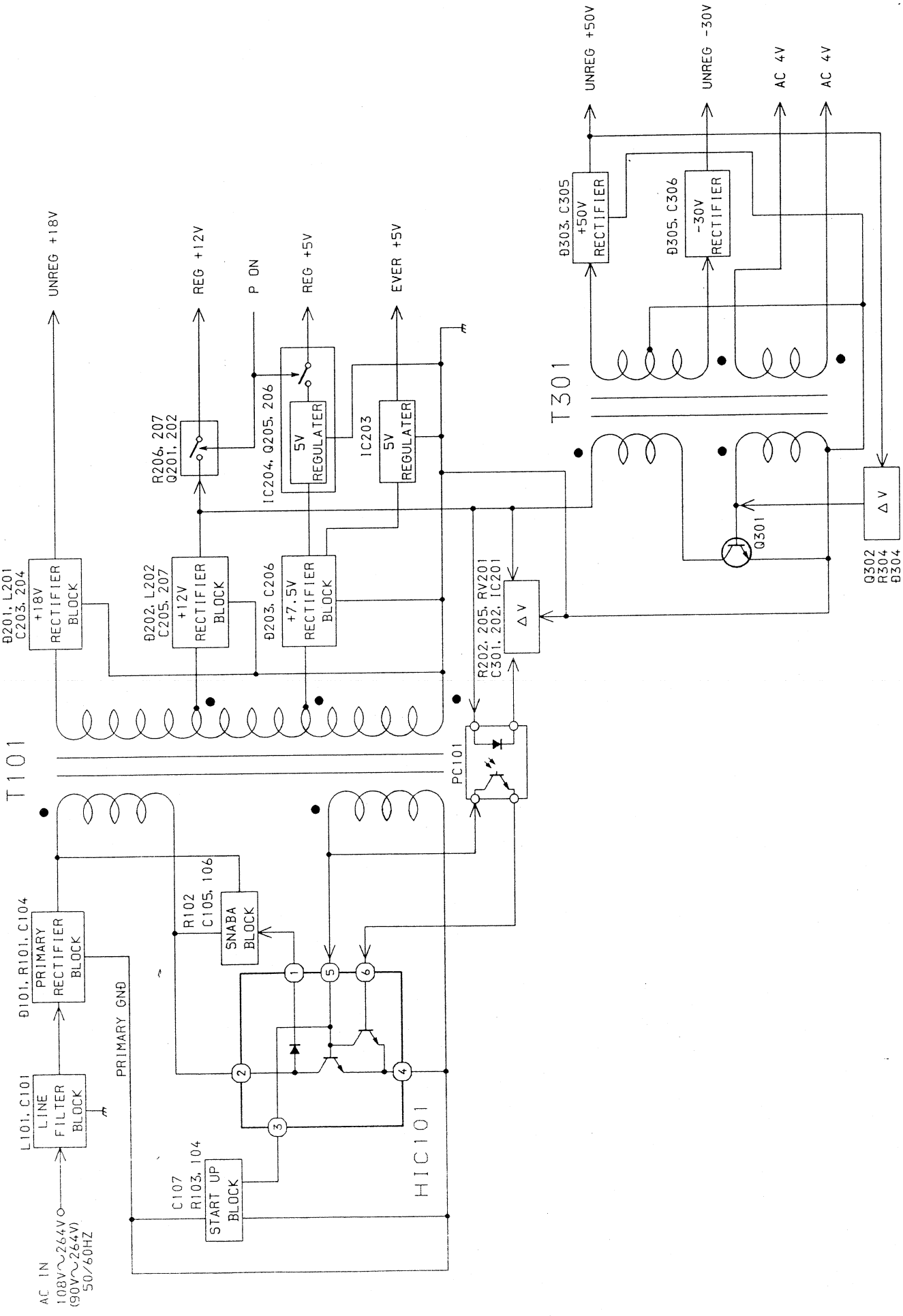

B SERVO/SYSCON C.B
A MAIN C.B
Đ TIMER C.B
STATE ĐETECTION
START.SENSOR
ENĐ.SENSOR
REEL.SENSOR
CASSETTE START
CASSETTE IN
CASSETTE OUT
MOĐE SW1
MOĐE SW2
MOĐE SW3
MOĐE SW4
REC SAFETY SW
HV-ĐK510MKII ONLY
IC207
TR LEĐ
RESET
AUTO TRACKING MICROPROCESSOR HĐ404302 (2K)
MECHANISM CONTROL MICROPROCESSOR MB88525 (4K)
IC201
TRKG RST
S.CLK
S.ĐAT
S·CLK
S·ĐAT
IC203
SERVO IC MN67481
SYNC
READY
REQ
SO
SI
SCK
RESET
X
EX
X201 6MHZ
EP ROM MSM16811
IC882
IC881
TUNER MICROPROCESSOR UPĐ1730
CS
SK
ĐI
ĐO
ROM CLK
EUSO
EUSI
TUSCK
TUSO
TUSI
TUCS
HV-ĐK510MKII ONLY
AUTO TRACKING LEĐ
Q909 BUFFER
Đ939
POWER ON LEĐ
Q910 BUFFER
Đ938
TU·SCK
TU·SO
TU·SI
TU·CS
POWER LEĐ
G1 ~ G10
A ~ J
FL901 (ĐISPLAY)
TEST
24h/12h
SERVICE
TIMER MICROPROCESSOR PĐ75208CW-A25
IC901
X903
BUZZER
KM0 ~ KM3
KEY.MATRIX
IC902
REMOTE CONT.
SBX1610-52
REMOTE CONTROL SIGNAL
X1
X2
X901 4.19MHZ
XT1
XT2
X902 32.768KHZ
RESET IC PST523Đ IC202

BLOCK DIAGRAM — 5 (TUNER)

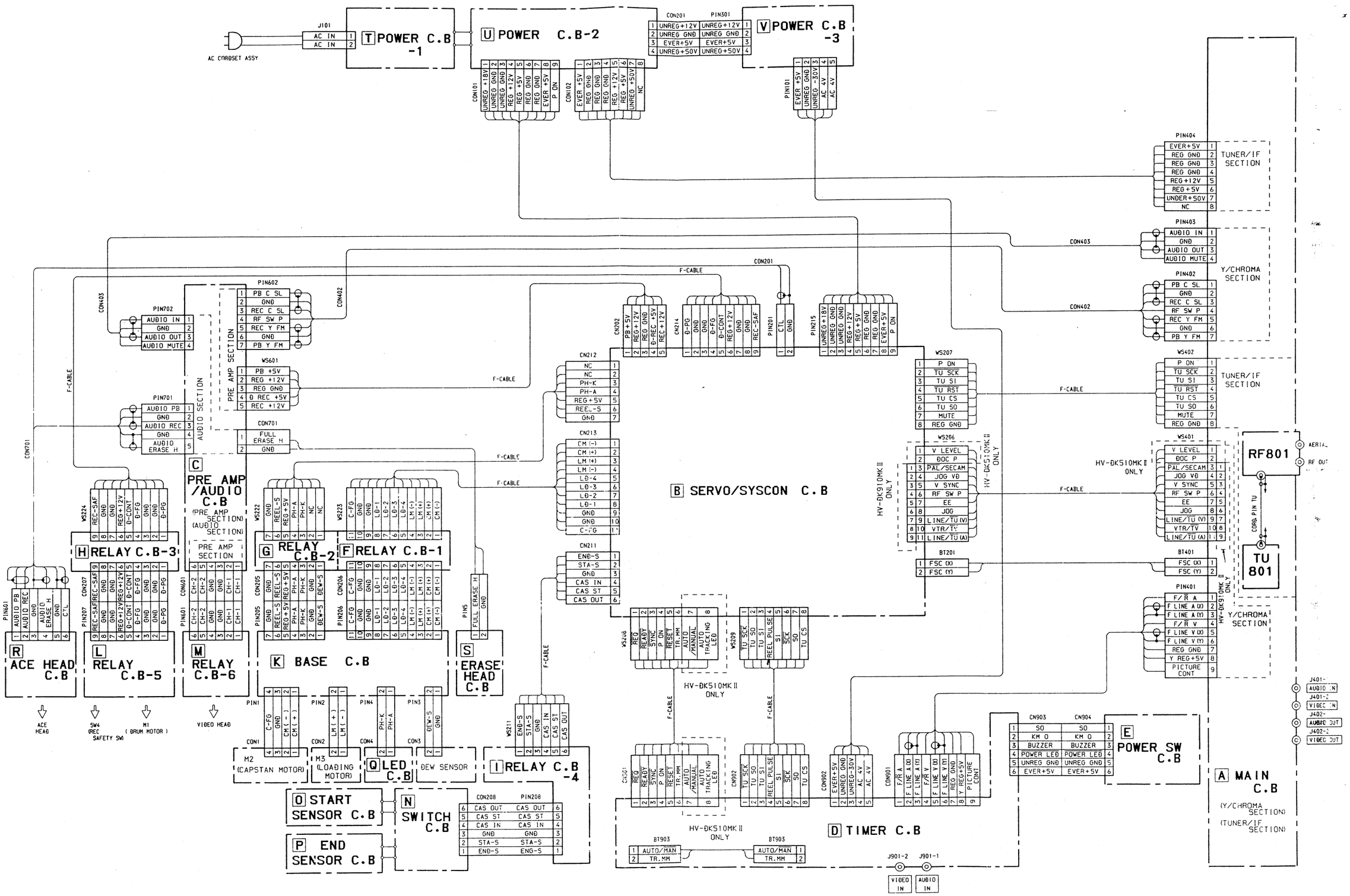


BLOCK DIAGRAM – 6 (AUDIO/POWER UNIT)




AC IN
108V~264V
(90V~264V)
50/60HZ
L101, C101
LINE FILTER BLOCK
D101, R101, C104
PRIMARY RECTIFIER BLOCK
PRIMARY GND
C107
R103, 104
START UP BLOCK
R102
C105, 106
SNABA BLOCK
HIC101
T101
PC101
R202, 205, RV201
C301, 202, IC201
Δ V
D201, L201
C203, 204
+18V RECTIFIER BLOCK
UNREG +18V
D202, L202
C205, 207
+12V RECTIFIER BLOCK
R206, 207
Q201, 202
REG +12V
D203, C206
+7.5V RECTIFIER BLOCK
IC204, Q205, 206
5V REGULATER
P ON
IC203
5V REGULATER
REG +5V
EVER +5V
T301
D303, C305
+50V RECTIFIER
UNREG +50V
D305, C306
-30V RECTIFIER
UNREG -30V
AC 4V
AC 4V
Q301
Δ V
Q302
R304
D304

WIRE HARNESS DIAGRAM



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

A B C D E F G H I J K

A MAIN C.B

To U POWER C.B-2 CON102
To C PRE AMP/AUDIO C.B PIN602 VIA CON402
To J AUDIO/VIDEO JACK C.B WS411
To CN405
To PIN402
To D TIMER C.B CON401
To PIN401
To C PRE AMP/AUDIO C.B PIN702 VIA CON403

VIDEO OUT | AUDIO OUT | VIDEO IN | AUDIO IN

RF MOD

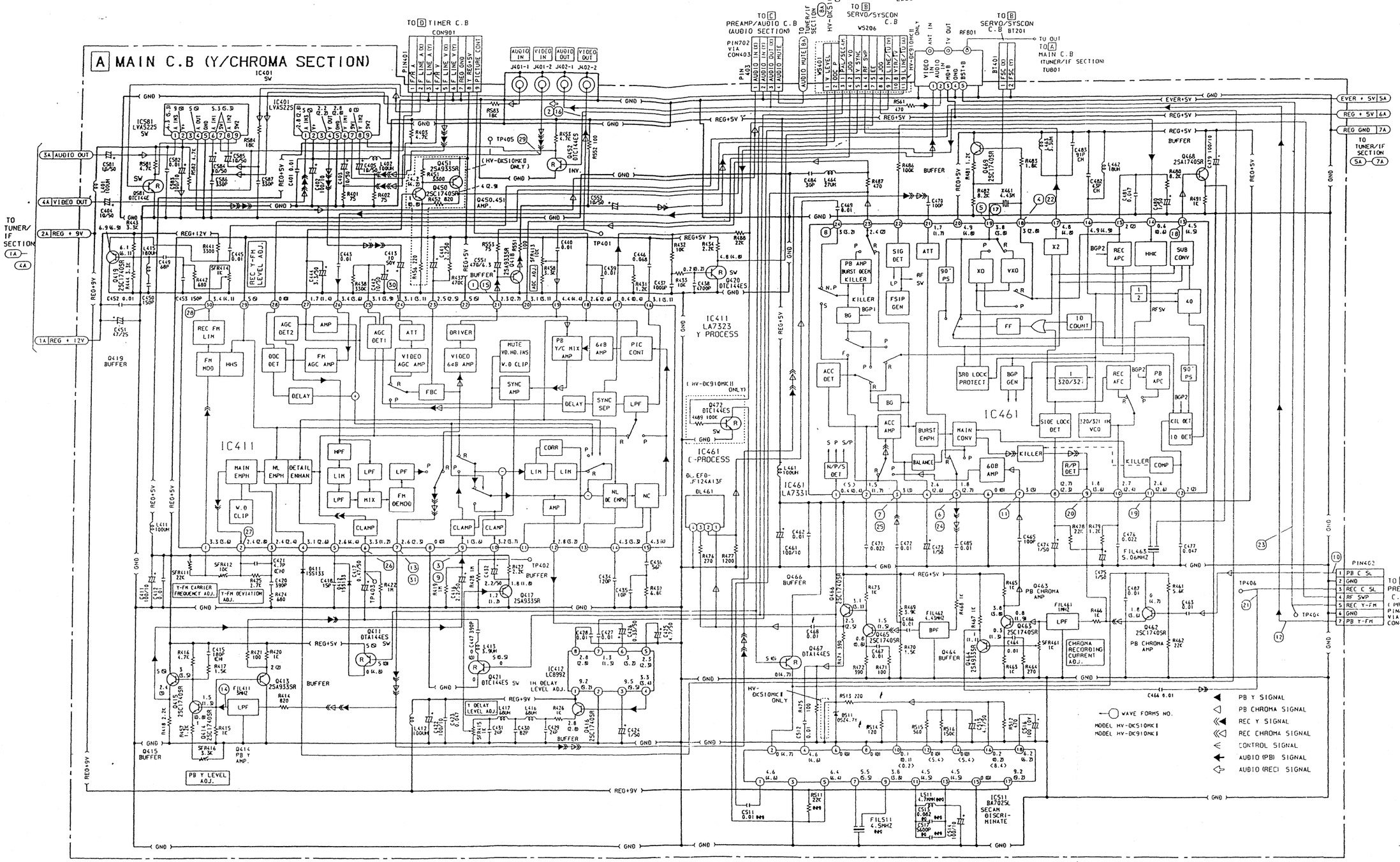
IC461 IC581 IC401 IC41 IC511 IC412 IC803 IC882 IC881 IC801 VIF801 IC207 IC201

B SERVO/SYSCON C.B

IC210 IC205 IC206 IC209 IC204 IC203 IC207 IC201

To C PRE AMP/AUDIO C.B WS601
To D POWER C.B-2 CON101
To F RELAY C.B-1 WS223
To R ACE HEAD C.B PIN6 VIA CON201
To G RELAY C.B-2 WS222
To H RELAY C.B-3 WS224
To D RELAY C.B-4 WS211
To D TIMER C.B CN902
To D TIMER C.B CN901

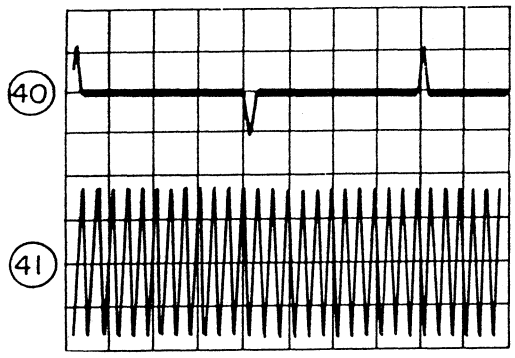
SCHEMATIC DIAGRAM — 1 (VIDEO)



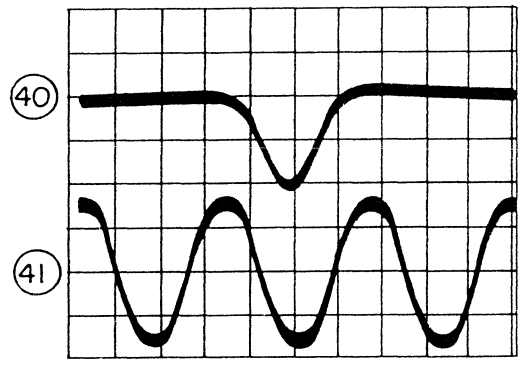
41 42 43

WAVE FORM — 1 SERVO WAVE FORM

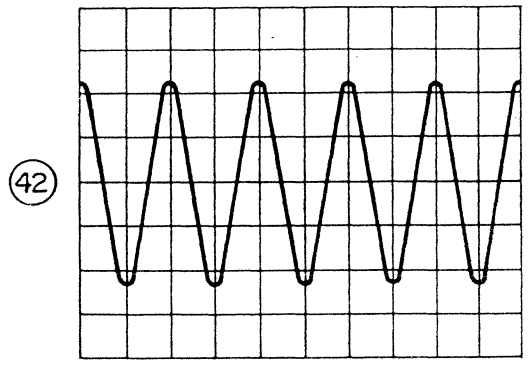
1. DRUM PG AND FG
   Upper : DRUM PG AC 0.1V/div.
   (IC203 pin (16))
   Lower : DRUM FG AC 50mV/div.
   (IC203 pin (17))
   Time 5ms/div.



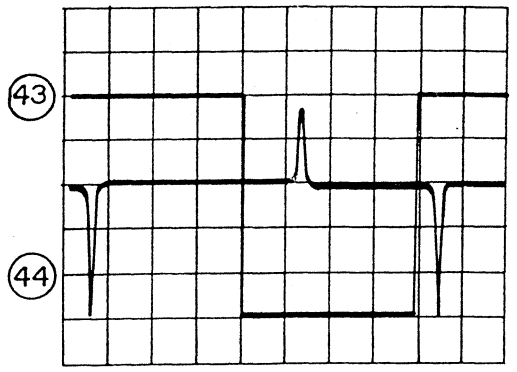
2. DRUM PG AND FG
   Enlargement of 1
   The PG pulse (upper) is generated (either positive or negative) when the FG pulse (lower) is a negative half wave.



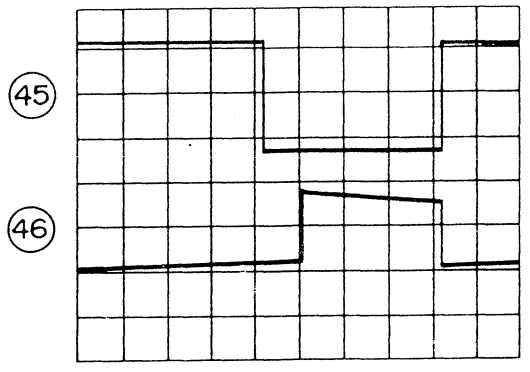
3. CAPSTAN FG (IC203 pin (18))
   AC 0.1V/div.
   Time 1ms/div.



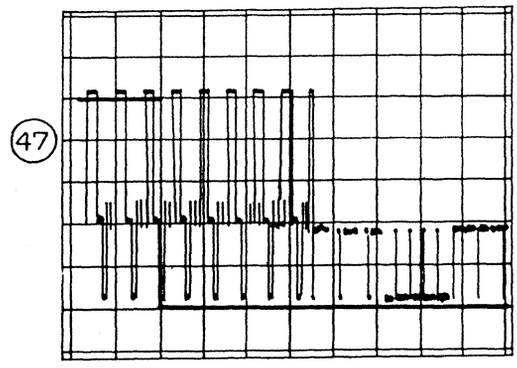
4. RF SW PULSE AND CTL (PB MODE)
   RF SW PULSE DC 1V/div. (IC203 pin (10))
   CTL AC 0.5V/div. (IC203 pin (22))
   Time 5ms/div.
   The CTL pulse (negative) is 2.3±0.3ms from the leading edge of the RF SW pulse.

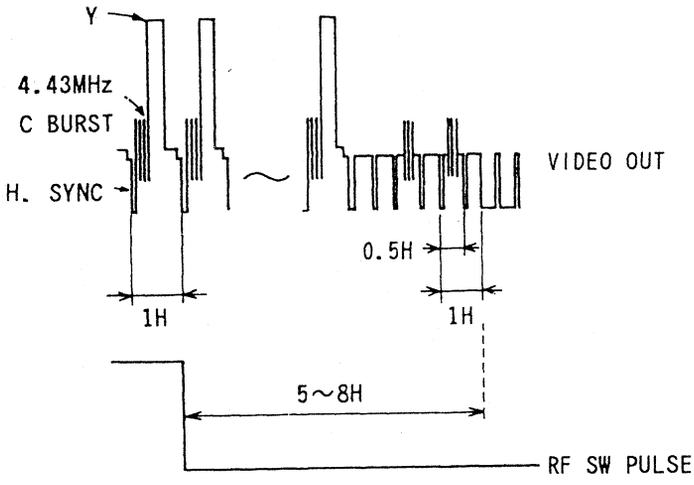


5. RF SW PULSE AND CTL (REC MODE)
   Upper : RF SW PULSE DC 2V/div.
   (IC203 pin (10))
   Lower : CTL AC 2V/div.
   (IC203 pin (22))
   Time 5ms/div.

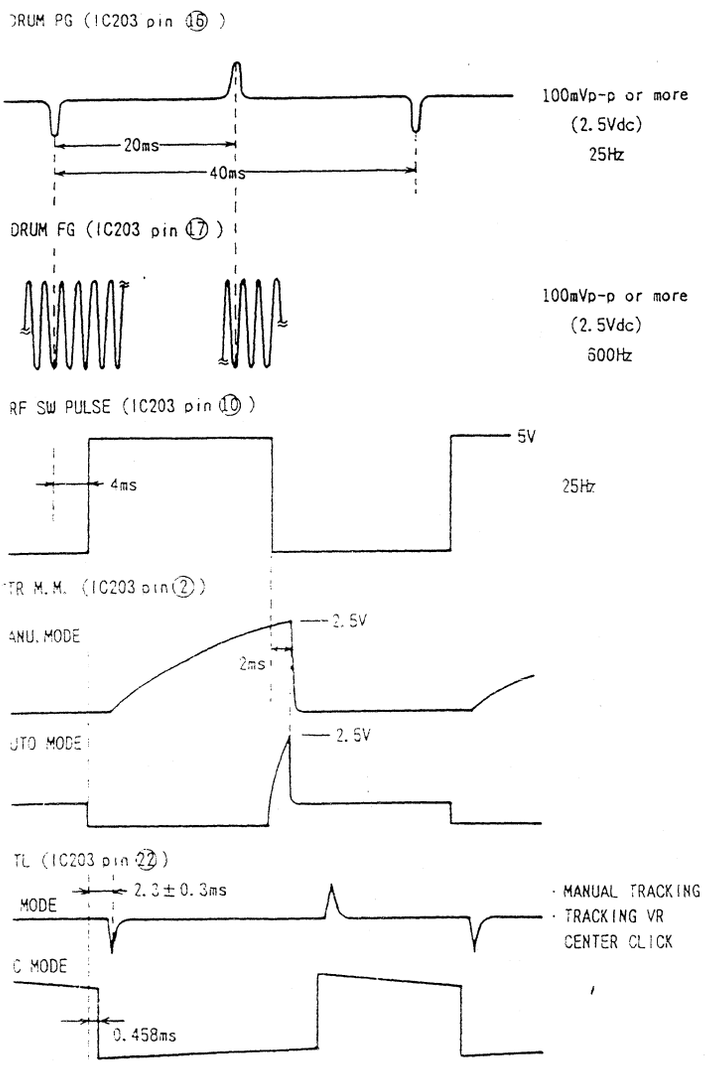


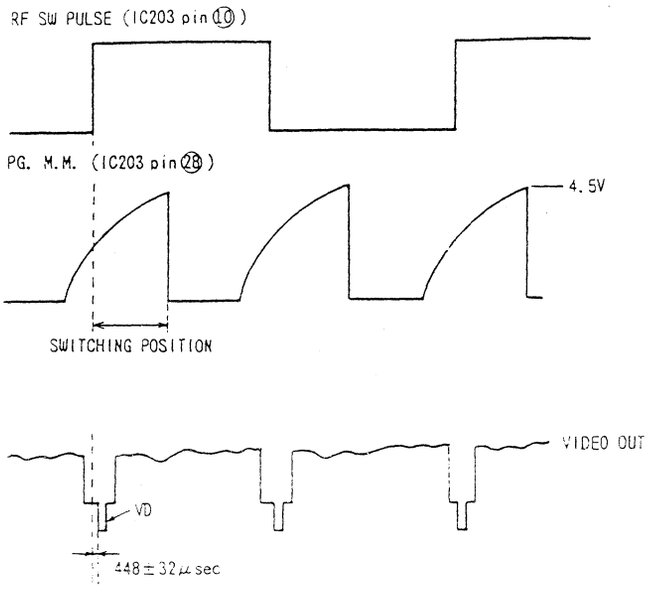
6. RF SW PULSE AND VIDEO OUT
   RF SW PULSE DC 1V/div. (IC203 pin ⑩)
   Video out (OPEN) AC 0.5V/div.
   Time 0.1ms/div.
   The RF SW pulse rises of falls 5~8H (320~512μs) before the VD (vertical sync) signal in the video signal.



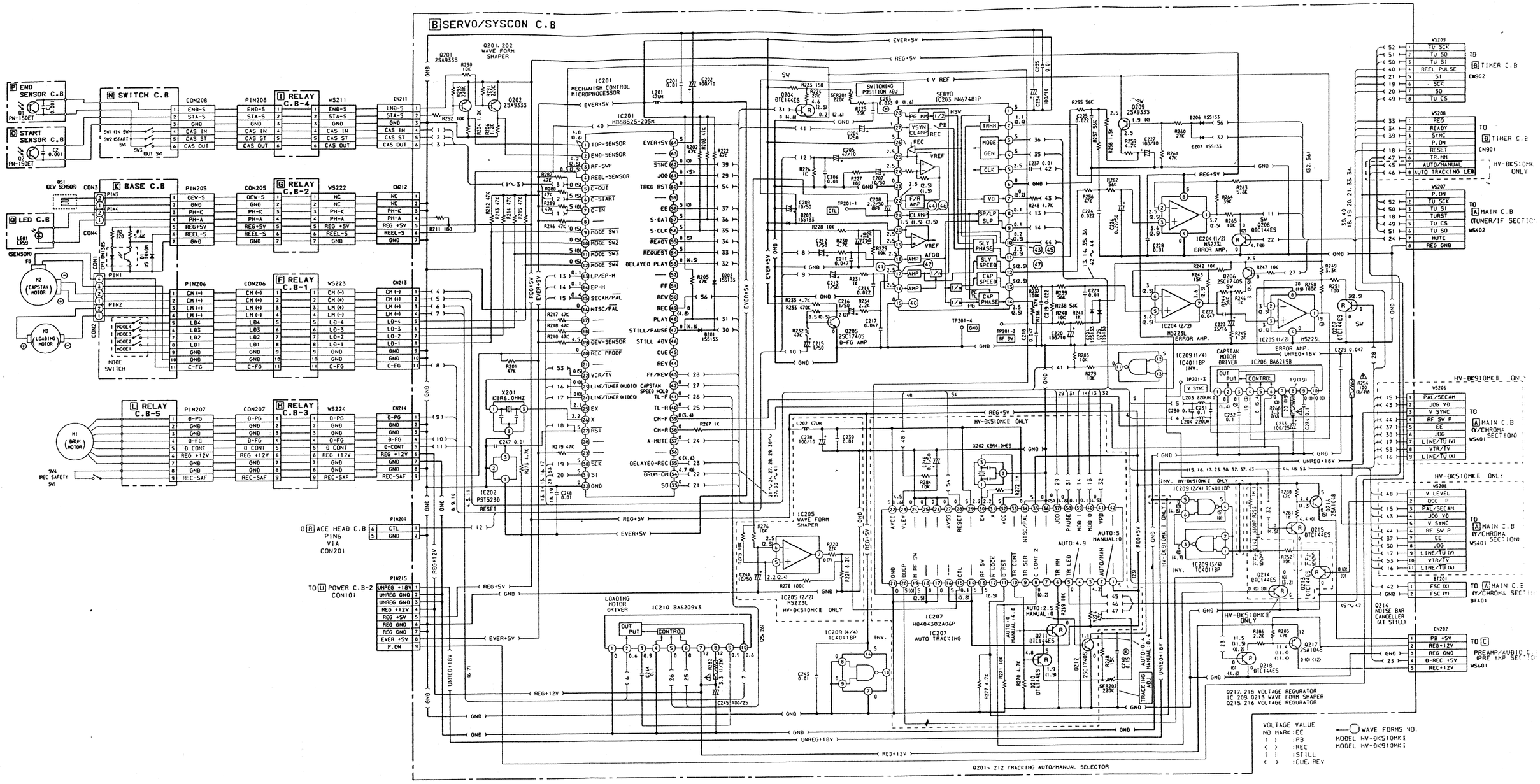


DRUM SERVO SYSTEM TIMING CHART





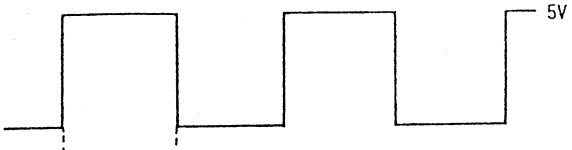
SCHEMATIC DIAGRAM — 2 (SERVO/SYSCON)



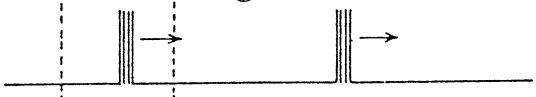
NOISE CANCELLER TIMING CHART

<During cancelling>

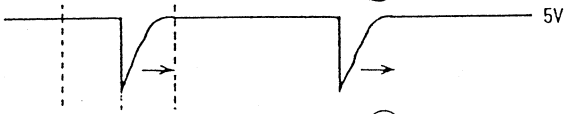
*RF SW PULSE (IC207 pin (19))



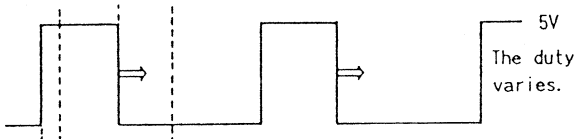
*DOC PULSE (Q213 (B) from VIDEO Block)



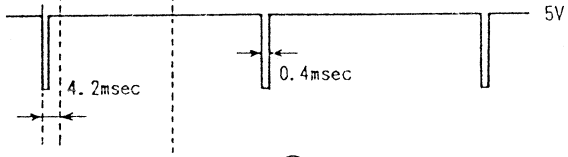
*DOC PULSE (1) (IC209 pin (1))



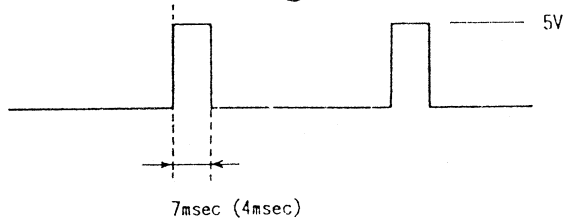
*DOC PULSE (2) (IC207 pin (20))



*$\overline{\text{D RST}}$ (IC207 pin (11))



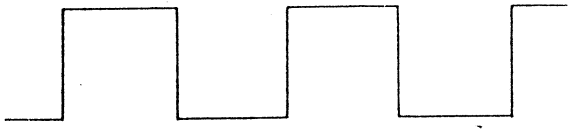
*C. CONT (IC209 pin (1))



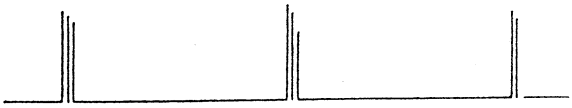
※This is a wave form when a noise bar is moved by slightly turning the capstan motor gradually using the C. CONT pulse.

<When cancelling finishes>

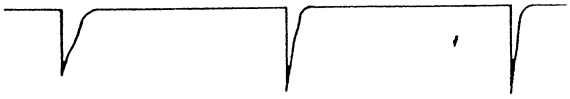
*RF SW PULSE (IC207 pin (19))



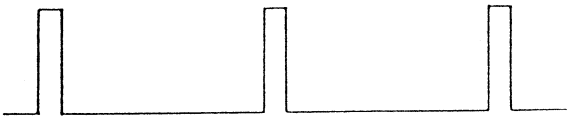
*DOC PULSE (Q213 (B))



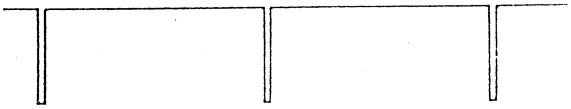
*DOC PULSE (1) (IC209 pin (1))



*DOC PULSE (2) (IC207 pin (20))

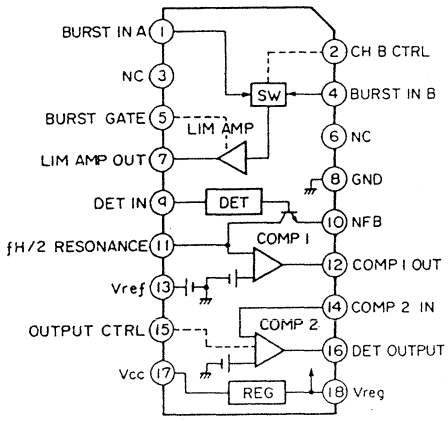


*$\overline{\text{D RST}}$ (IC207 pin (11))

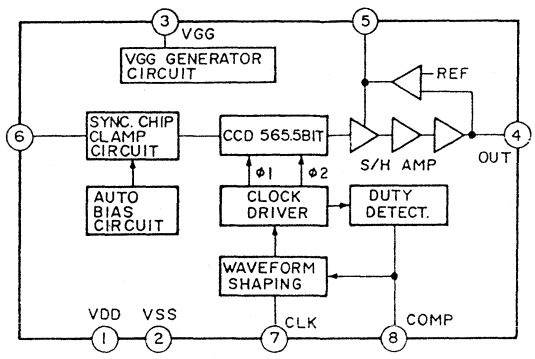


IC BLOCK DIAGRAM — 1

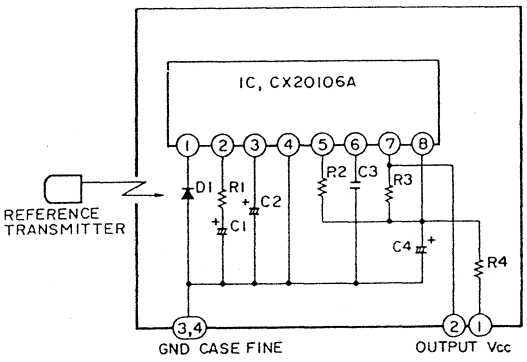
IC,BA7025L



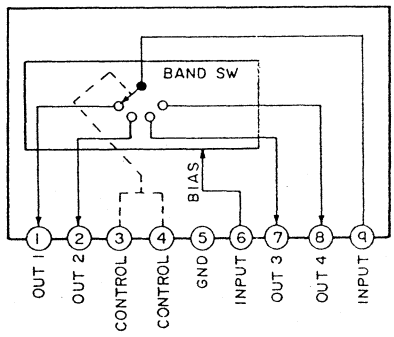
IC,LC8992



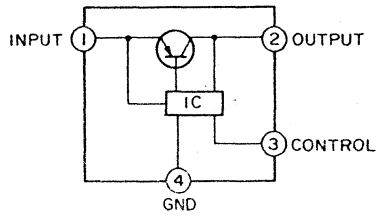
IC,SBX1610



IC,LA7910

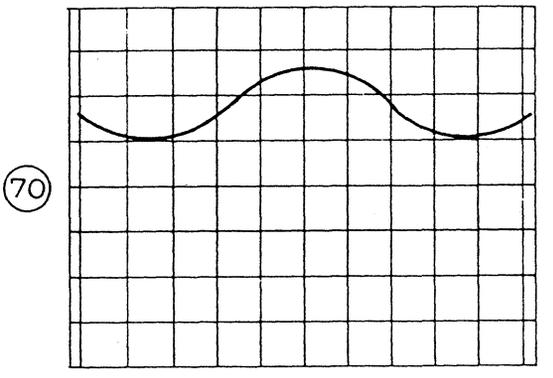


IC,PQ09R05

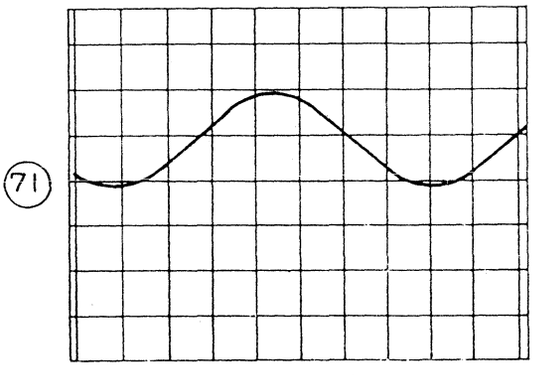


WAVE FORM－2 AUDIO WAVE FORM

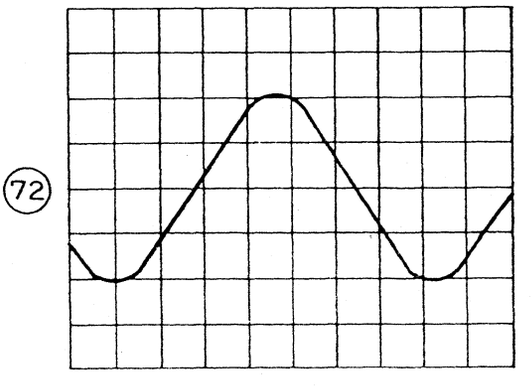
T701 pin①
5V/div.
2μs/div.



T701 pin③
10V/div.
2μs/div.

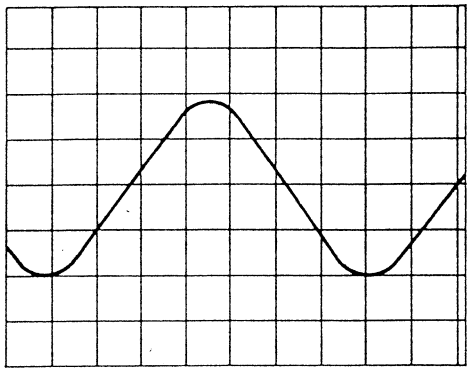


T701 pin⑤
10V/div.
2μs/div.



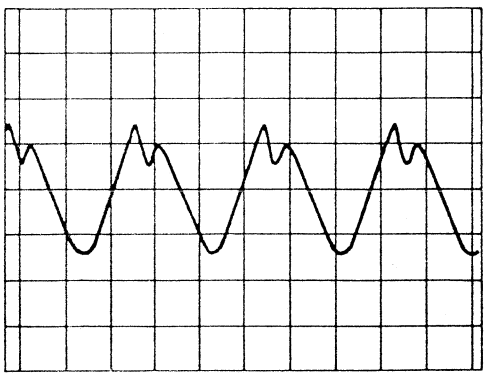
T701 pin (6)
20V/div.
2μs/div.

(73)



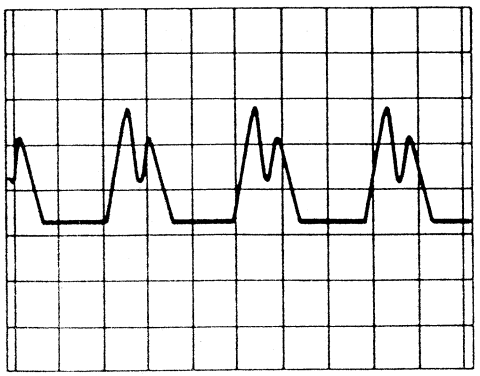
Q701 base
1V/div.
5μs/div.

(74)



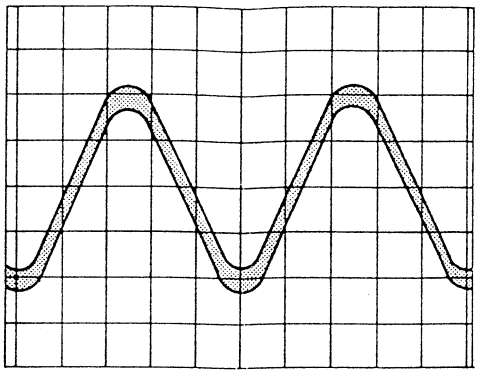
Q701 emitter
500mV/div.
5μs/div.

(75)



IC701 pins (7) and (8)
20mV/div.
200μs/div.

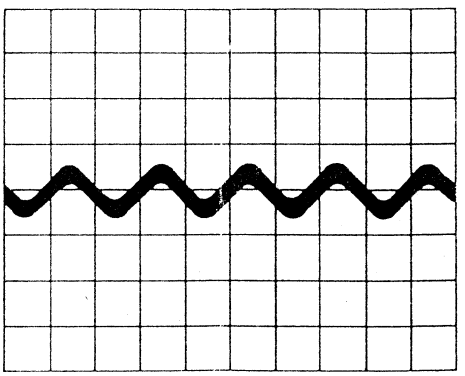
(76)



- The wave form shown in the photo on the left is at pin (11) of IC701.
- IC701 pins (14) to (17) are 900mVp-p.
- The specification of the EE level is -8.5 ±1dBs when a 1kHz −10dBs signal is input.

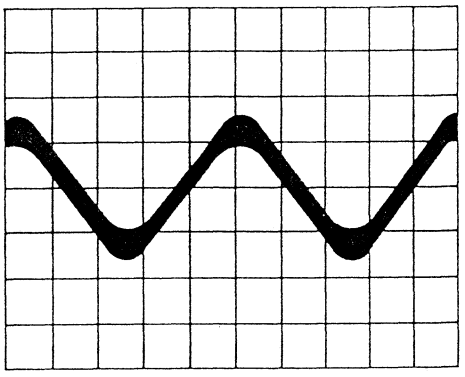
20mV/div.
500μs/div.

(77)



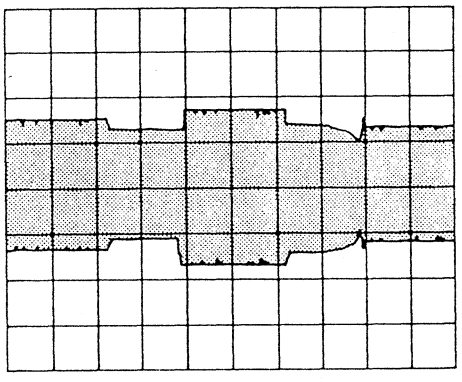
◦ The wave form shown in the photo on the left is at pins (20) and (23) of IC701.
◦ IC701 pin (25) is 1.53Vp-p.
50mV/div.
200μs/div.

(78)



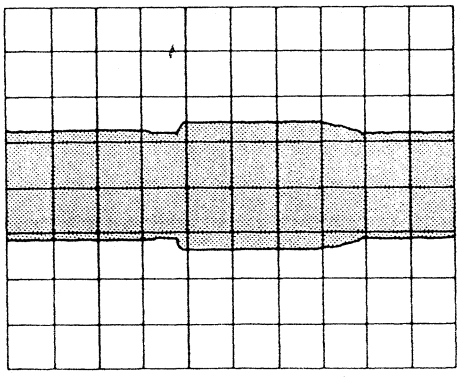
PIN602 pin (1) (PB)
5ms/div.
100mV/div.

(79)



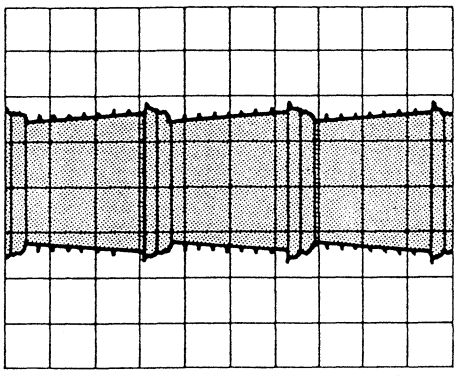
PIN602 pin (7) (PB)
5ms/div.
200mV/div.

(80)



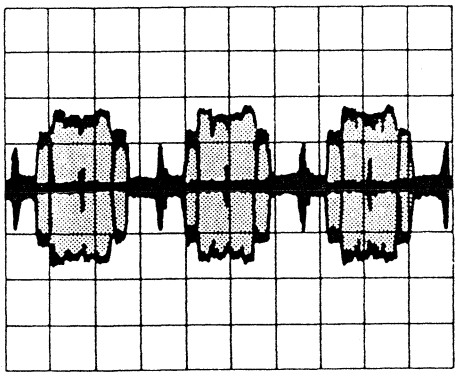
PIN602 pin (5) (REC)
20μs/div.
100mV/div.

(81)



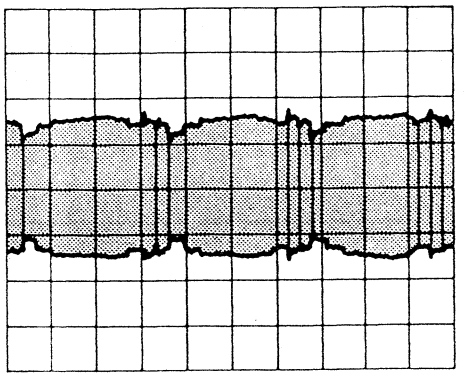
PIN602 pin (3) (REC)
20μs/div.
20mV/div.

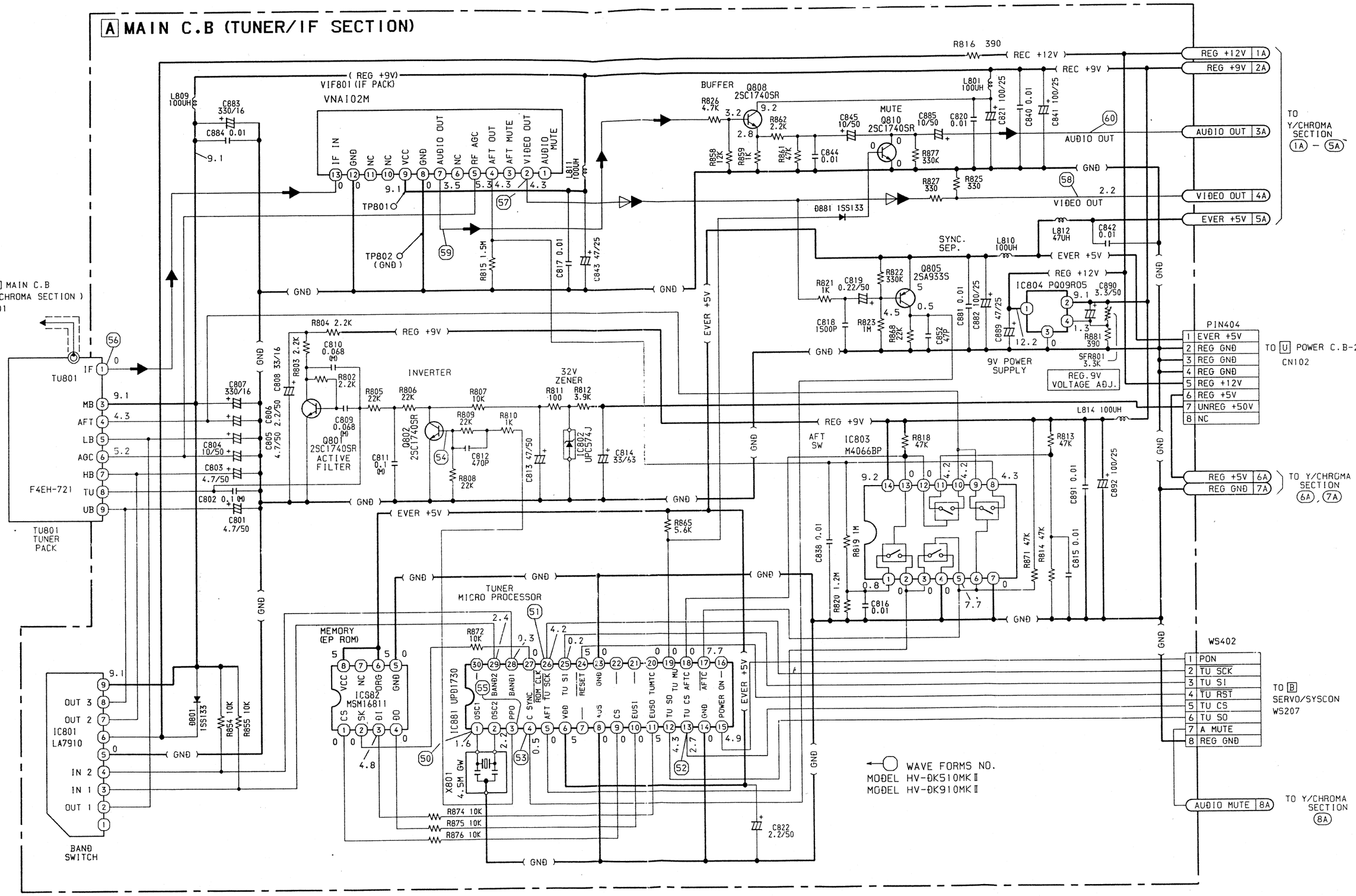
(82)



IC610 pin (18) (REC)
20μs/div.
50mV/div.

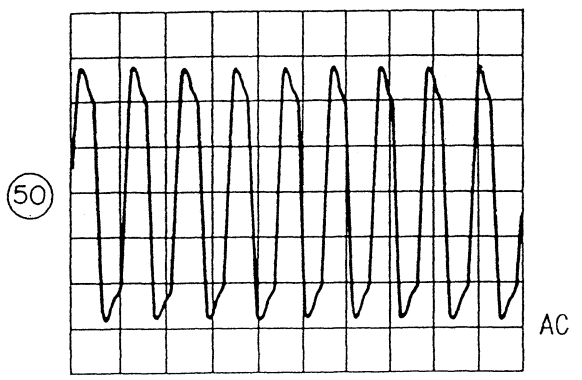
(83)



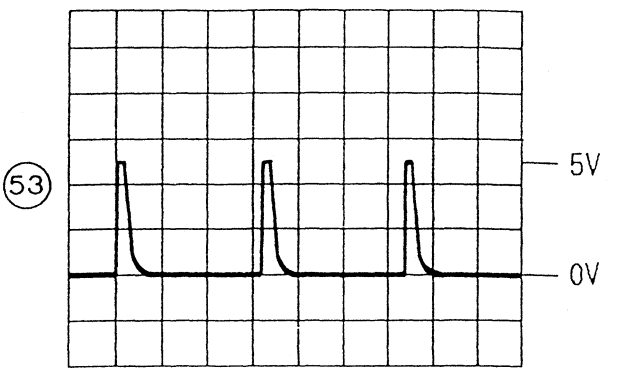

A MAIN C.B (TUNER/IF SECTION)
VIF801 (IF PACK)
VNA102M
IF IN
GND
NC
NC
VCC
GND
AUDIO OUT
NC
RF AGC
AFT OUT
AFT MUTE
VIDEO OUT
AUDIO MUTE
TP801
TP802 (GND)
TU801
TUNER PACK
F4EH-721
IF
MB
AFT
LB
AGC
HB
TU
UB
TO A MAIN C.B (Y CHROMA SECTION) RF801
BUFFER Q808 2SC1740SR
MUTE Q810 2SC1740SR
Q805 2SA933S
D881 1SS133
D801 1SS133
SYNC. SEP.
IC804 PQ09RO5
9V POWER SUPPLY
SFR801 3.3K
REG.9V VOLTAGE ADJ.
INVERTER
Q801 2SC1740SR ACTIVE FILTER
Q802 2SC1740SR
32V ZENER
IC802 UPC574J
IC803 M4066BP
AFT SW
IC801 LA7910
BAND SWITCH
OUT 3
OUT 2
OUT 1
IN 2
IN 1
TUNER MICRO PROCESSOR
IC881 UPD1730
IC882 MSM16811
MEMORY (EP ROM)
X801 4.5M GW
REC +12V
REC +9V
REG +12V
REG +9V
EVER +5V
GND
AUDIO OUT
VIDEO OUT
TO Y/CHROMA SECTION (1A) – (5A)
REG +12V 1A
REG +9V 2A
AUDIO OUT 3A
VIDEO OUT 4A
EVER +5V 5A
PIN404
1 EVER +5V
2 REG GND
3 REG GND
4 REG GND
5 REG +12V
6 REG +5V
7 UNREG +50V
8 NC
TO U POWER C.B-2 CN102
REG +5V 6A
REG GND 7A
TO Y/CHROMA SECTION (6A), (7A)
WS402
1 PON
2 TU SCK
3 TU SI
4 TU RST
5 TU CS
6 TU SO
7 A MUTE
8 REG GND
TO B SERVO/SYSCON WS207
AUDIO MUTE 8A
TO Y/CHROMA SECTION (8A)
WAVE FORMS NO.
MODEL HV-DK510MK II
MODEL HV-DK910MK II

WAVE FORM－3 TUNER WAVE FORM

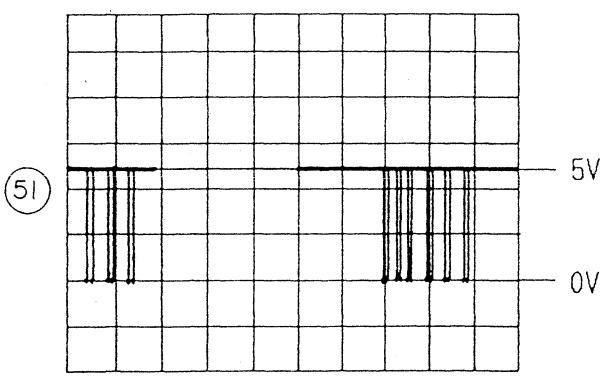
IC881 pin①
Oscillated by the microprocessor
1V/div.
200ns/div.



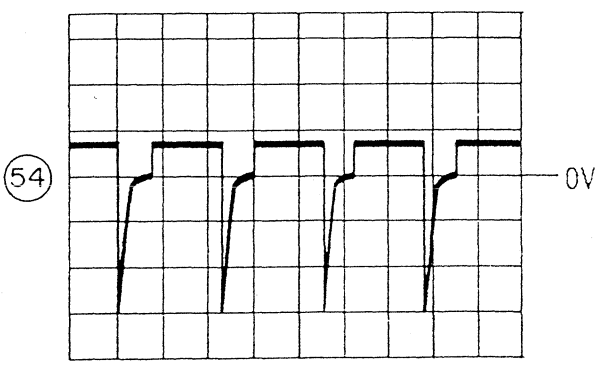
IC881 pin④
H. sync
2V/div.
20μs/div.



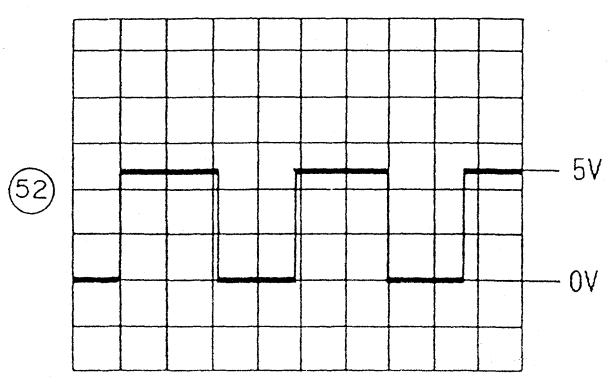
IC881 pin㉖
Clock of microprocessor
2V/div.
20ms/div.



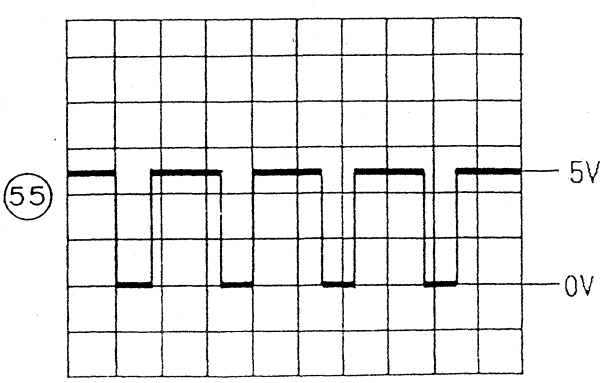
Q802 base
1V/div.
50μs/div.



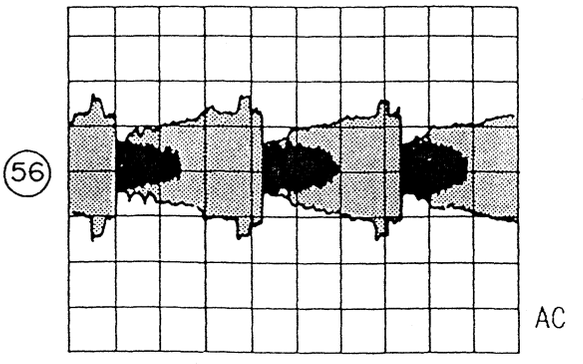
IC881 pin⑬
Microprocessor chip select
2V/div.
20ms/div.



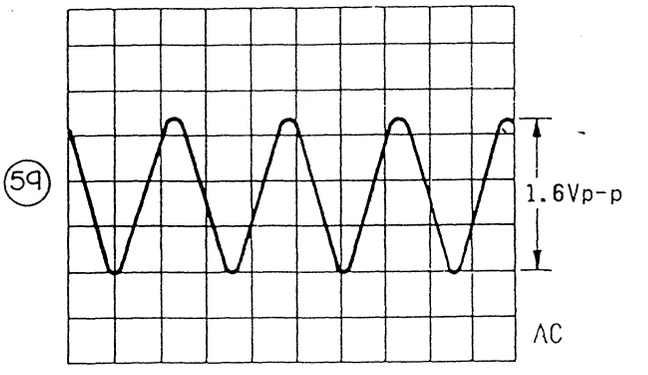
IC881 pin③
Pulse for generating a tuning voltage
The pulse width varies for different channels.
2V/div.
50μs/div.



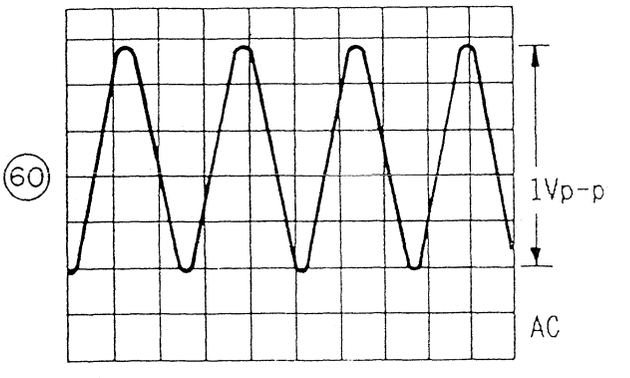
TU801 pin①
IF signal
P: Color bar signal
50ms/div.
20μs/div.



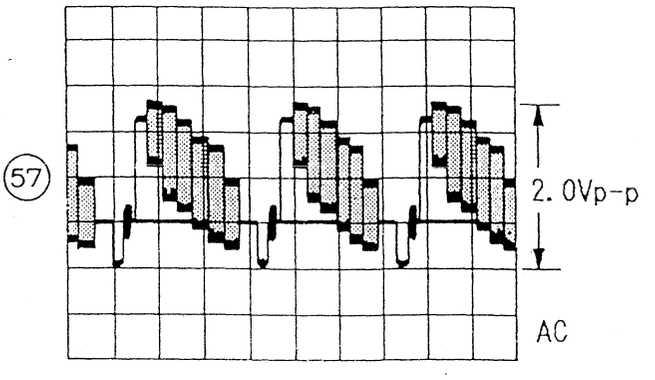
VIF801 pin ⑦
TU AUDIO OUT
When modulated
at 400Hz and 50kHz
500mV/div.
1ms/div.



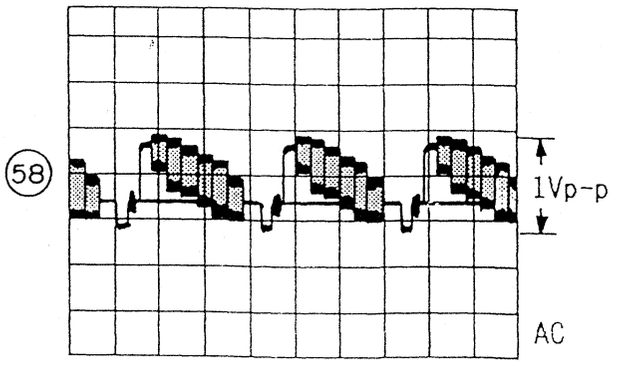
TP804
TU AUDIO OUT
When modulated
at 400Hz and 50kHz
200mV/div.
1ms/div.



VIF801 pin②
500mV/div.
20μs/div.

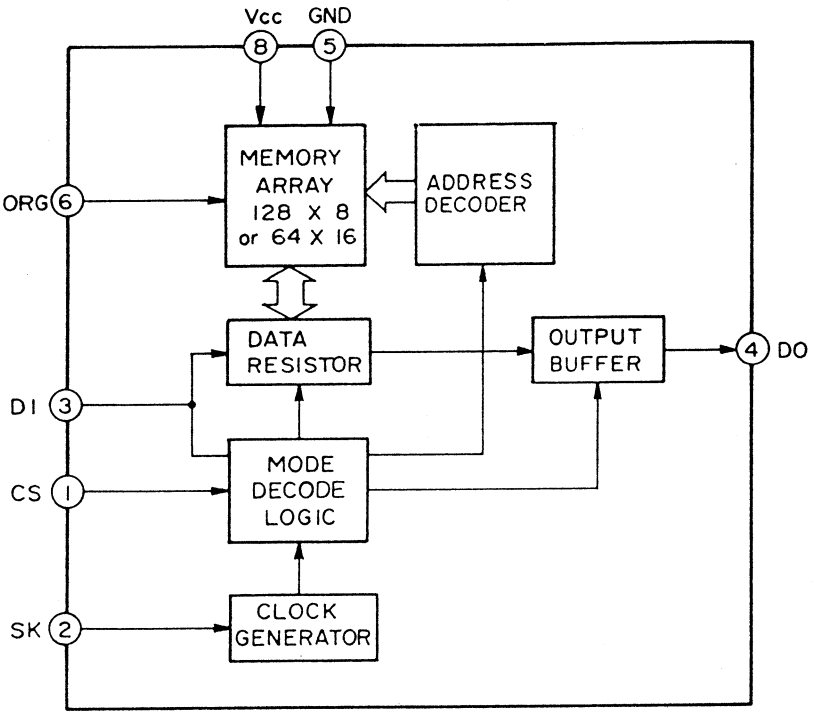


TP805
TU VIDEO OUT 75Ω TERMINATE
500mV/div.
20μs/div.

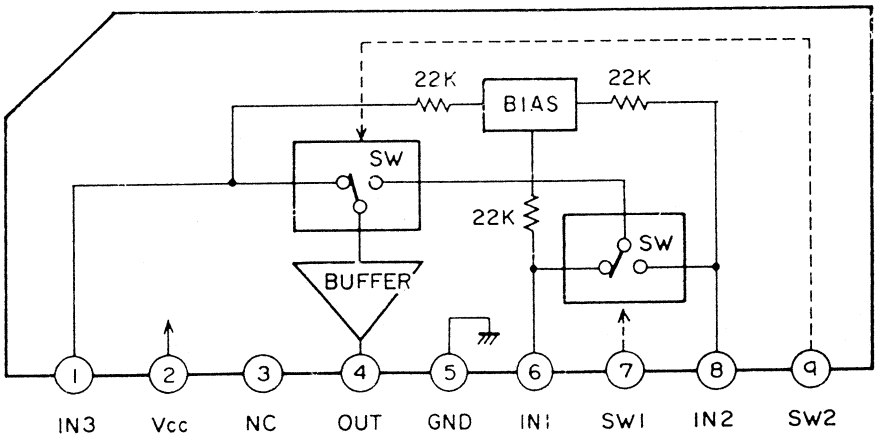


IC BLOCK DIAGRAM — 2

IC,MSM16811



IC,LVA522S

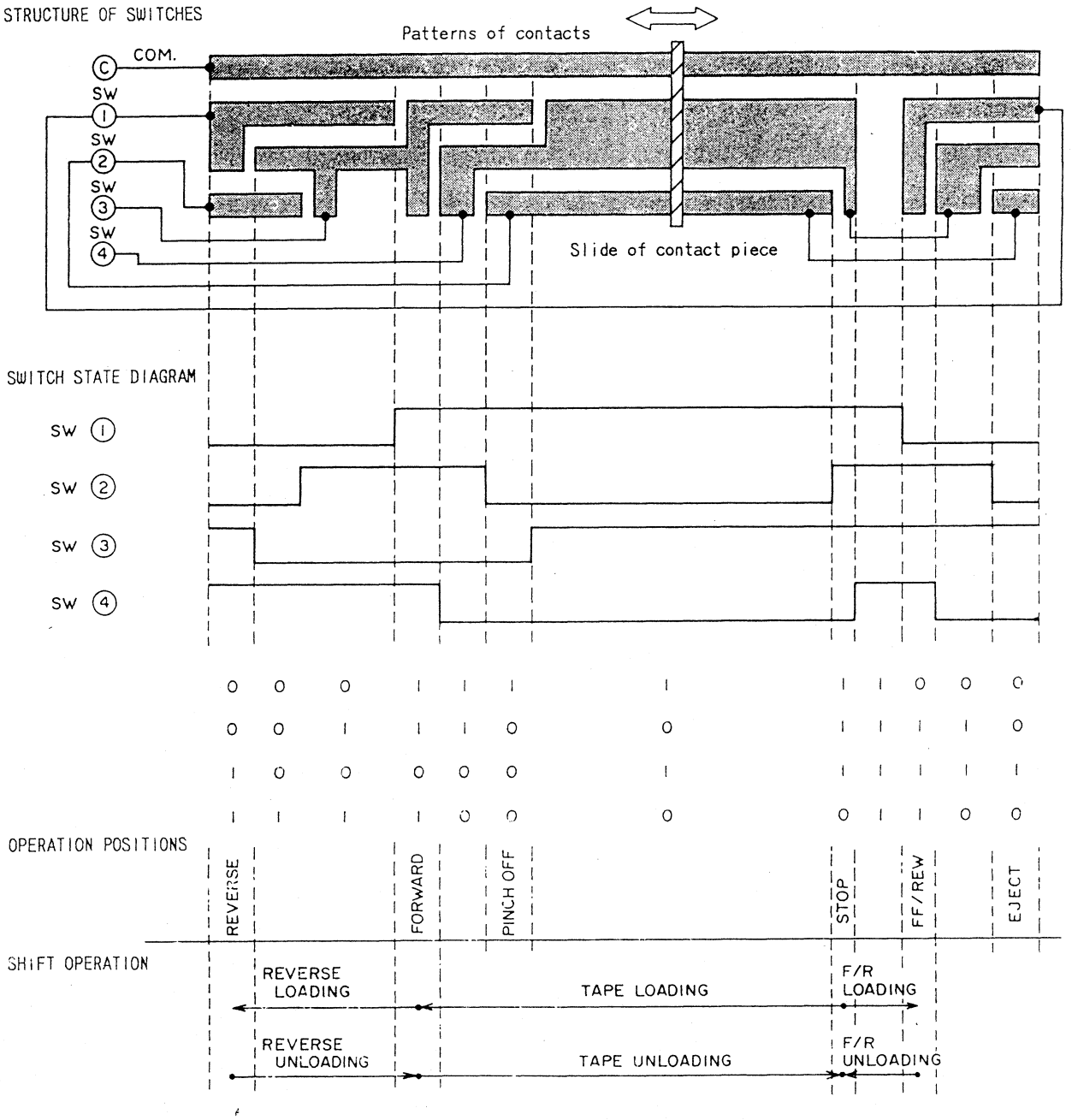


CONTROL INPUT
TRUTH TABLE

SW1	SW2	OUT
L	L	IN1
H	L	IN2
	H	IN3

SYSTEM SWITCH MODE

※When SYSTEM CONTROL IC has run away SYSTEM CONTROL IC will not accept any mode.



SWITCH				Position
SW1	SW2	SW3	SW4	
0	0	1	0	Front loading, Eject
0	1	1	0	Intermediate
0	1	1	1	F.F, REW
1	1	1	1	Intermediate
1	1	1	0	Stop
1	0	1	0	Tape loading
1	0	0	0	Gear change
1	1	0	0	Intermediate
1	1	0	1	Play (Pause)
0	1	0	1	Intermediate
0	0	0	1	Intermediate
0	0	1	1	Reset

T POWER C.B-1

U POWER C.B-2

V POWER C.B-3

F RELAY C.B-1

G RELAY C.B-2

K BASE C.B

C PRE AMP/AUDIO C.B

S ERASE HEAD C.B

R ACE HEAD C.B

H RELAY C.B-3

M RELAY C.B-6

L RELAY C.B-5

P END SENSOR C.B

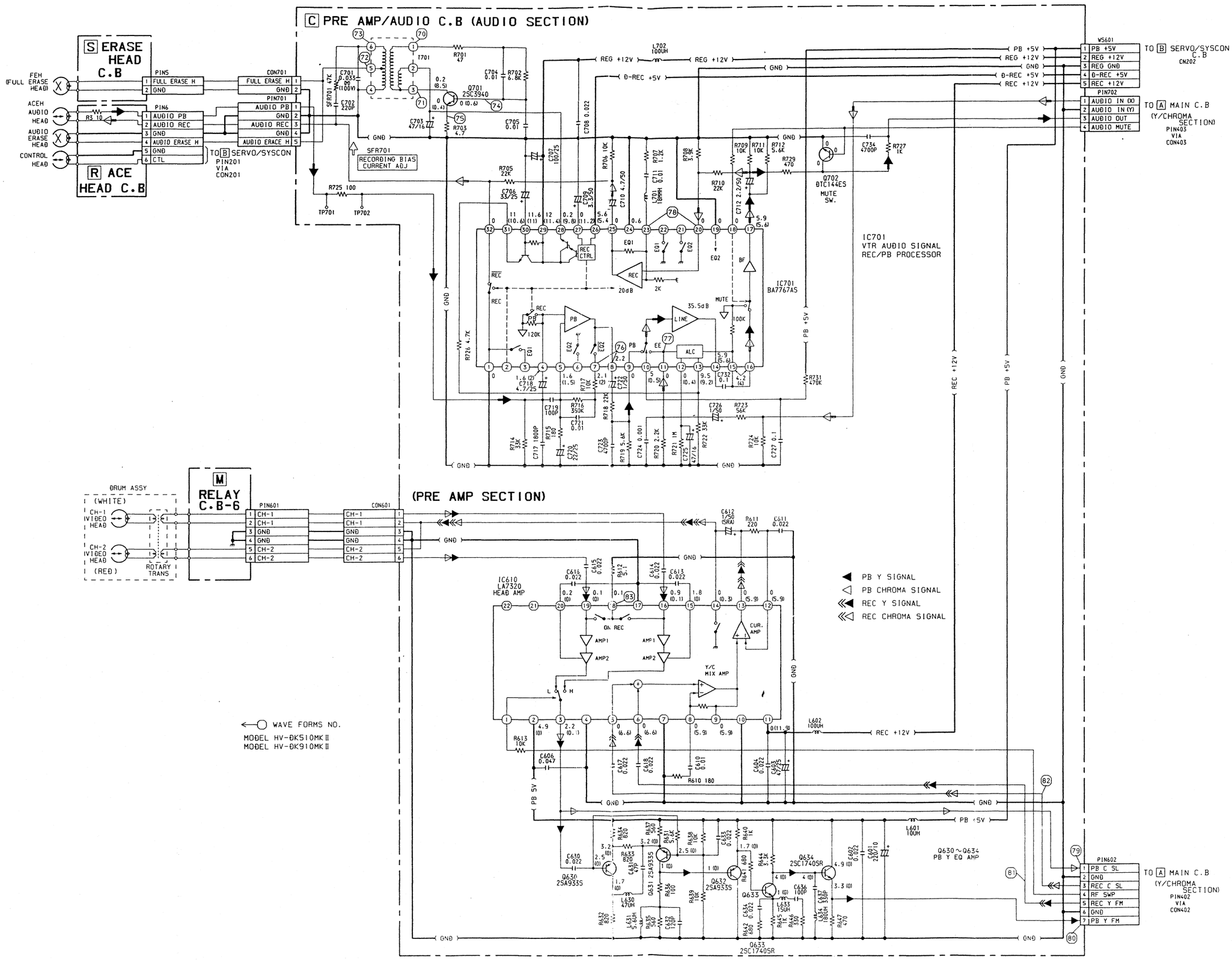
O START SENSOR C.B

Q LED C.B

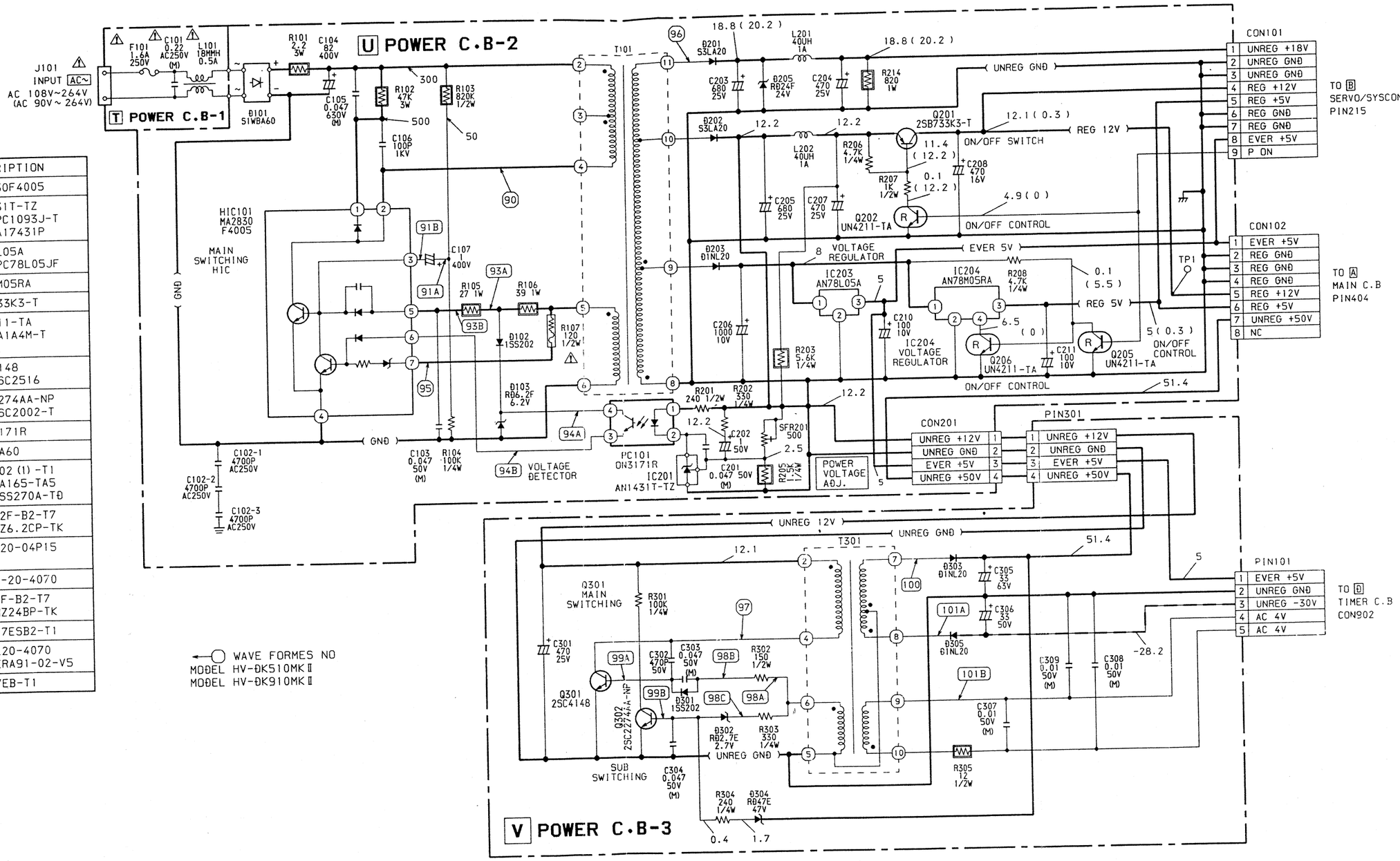
N SWITCH C.B

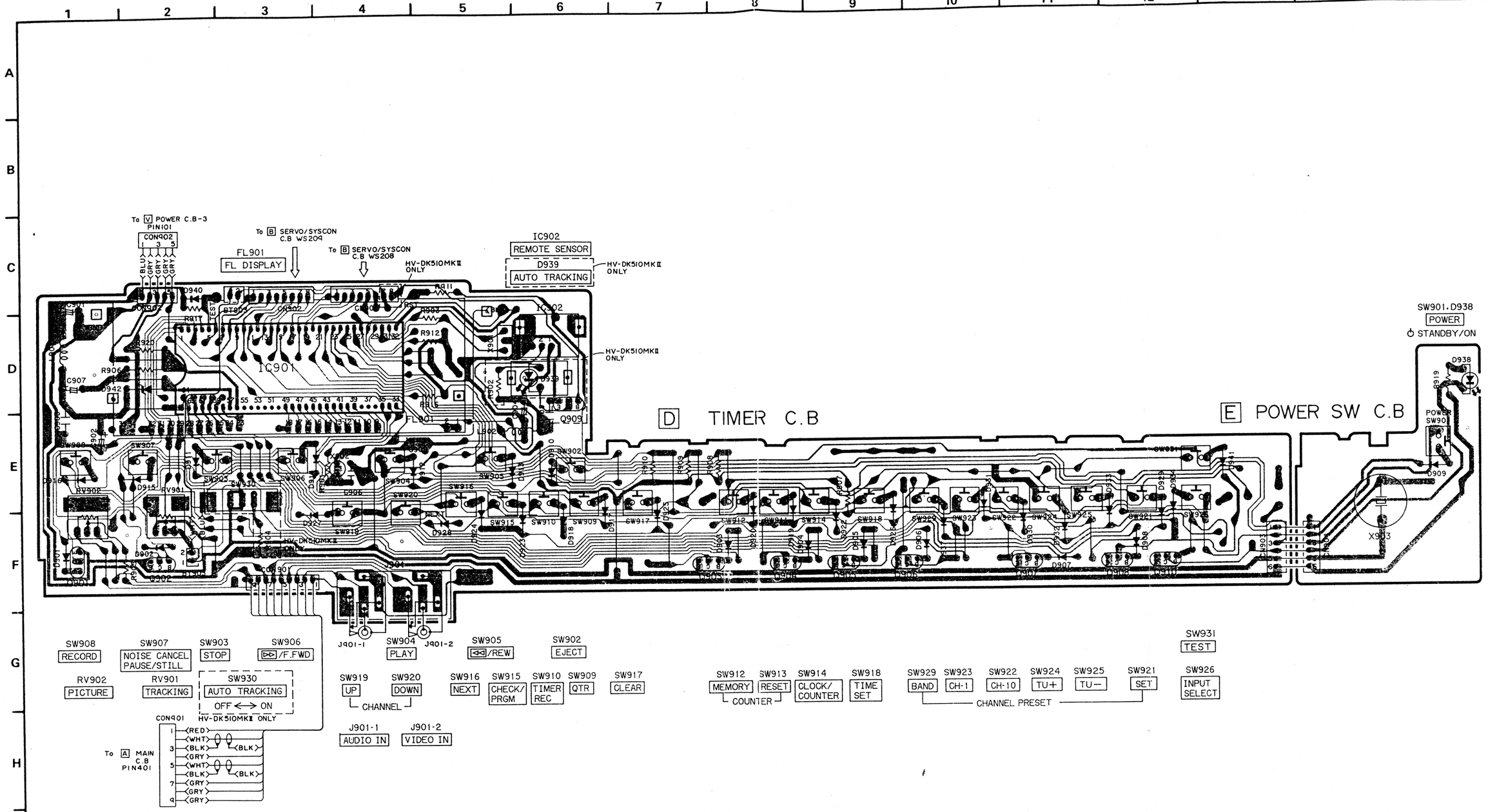
I RELAY C.B-4

SCEMATIC DIAGRAM — 4 (PRE AMP./AUDIO/POWER UNIT)

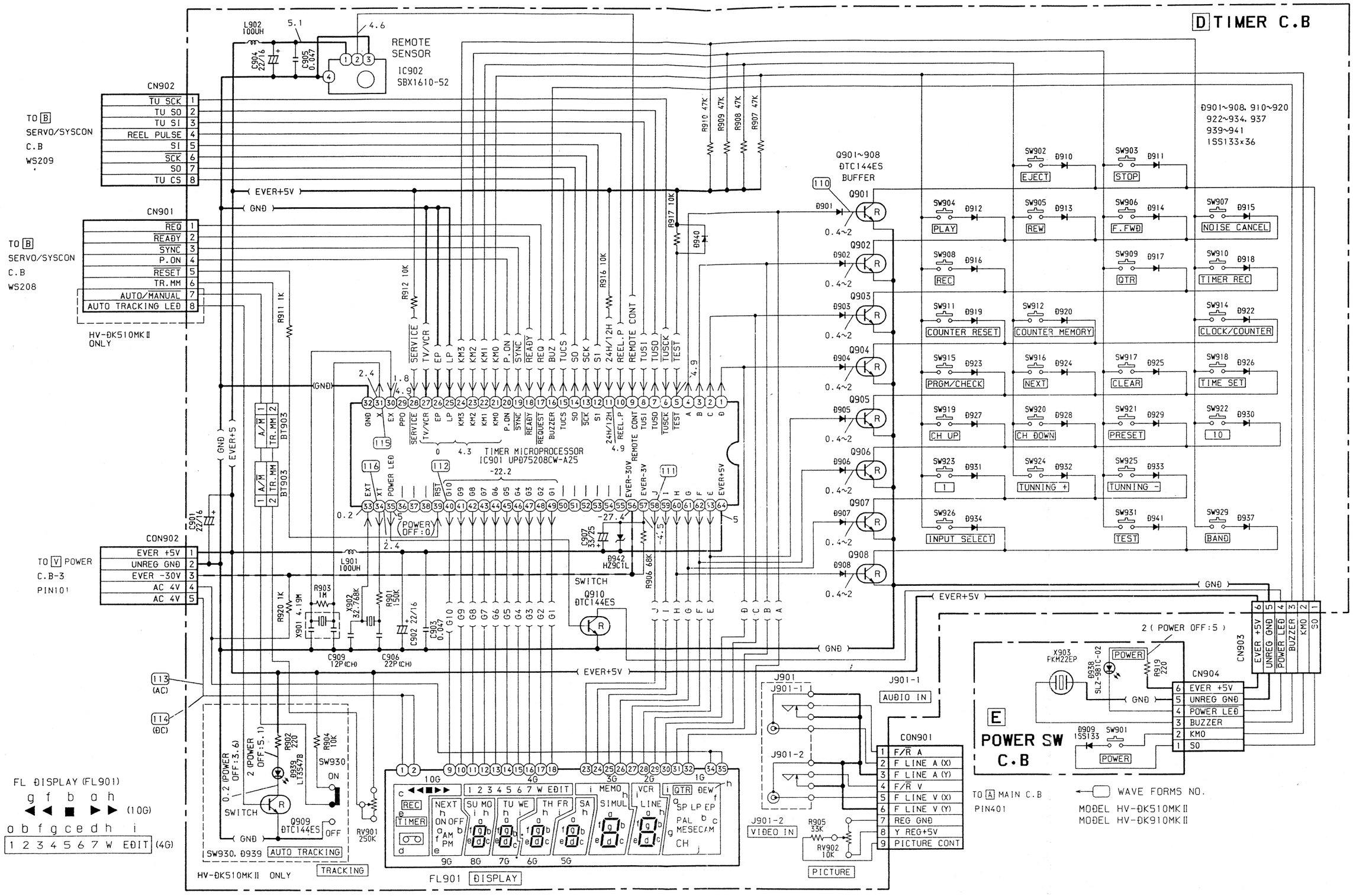


REF NO	ÐESCRIPTION
HIC101	MA2830F4005
IC201	AN1431T-TZ OR μPC1093J-T OR HA17431P
IC203	AN78L05A OR μPC78L05JF
IC204	AN78M05RA
Q201	2SB733K3-T
Q202, 205, 206	UN4211-TA OR AA1A4M-T
Q301	2SC4148 OR 2SC2516
Q302	2SC2274AA-NP OR 2SC2002-T
PC101	ON 3171R
Ð101	S1WBA60
Ð102, 301	1SS202 (1) -T1 OR MA165-TA5 OR 1SS270A-TÐ
Ð103	RÐ6.2F-B2-T7 OR HZ6.2CP-TK
Ð201, 202	S3LA20-04P15
Ð203	ÐINL-20-4070
Ð205	RÐ24F-B2-T7 OR HZ24BP-TK
Ð302	RÐ2.7ESB2-T1
Ð303, 305	ÐINL20-4070 OR ERA91-02-V5
Ð304	RÐ47EB-T1



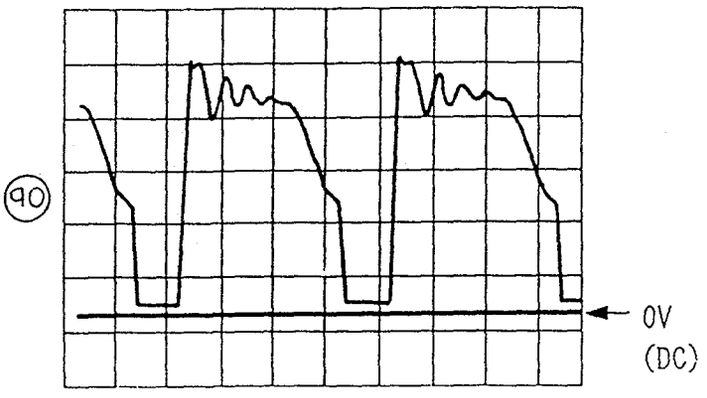

To V POWER C.B-3 PIN101
CON902
FL901
FL DISPLAY
To B SERVO/SYSCON C.B WS209
To B SERVO/SYSCON C.B WS208
HV-DK510MKII ONLY
IC902
REMOTE SENSOR
D939
AUTO TRACKING
HV-DK510MKII ONLY
IC901
D TIMER C.B
E POWER SW C.B
SW901,D938
POWER
STANDBY/ON
SW908
RECORD
SW907
NOISE CANCEL
PAUSE/STILL
SW903
STOP
SW906
/F.FWD
SW904
PLAY
SW905
/REW
SW902
EJECT
RV902
PICTURE
RV901
TRACKING
SW930
AUTO TRACKING
OFF ⟷ ON
HV-DK510MKII ONLY
SW919
UP
SW920
DOWN
CHANNEL
SW916
NEXT
SW915
CHECK/
PRGM
SW910
TIMER
REC
SW909
QTR
SW917
CLEAR
J901-1
AUDIO IN
J901-2
VIDEO IN
CON901
To A MAIN C.B PIN401
RED
WHT
BLK
GRY
SW931
TEST
SW912
MEMORY
SW913
RESET
COUNTER
SW914
CLOCK/
COUNTER
SW918
TIME
SET
SW929
BAND
SW923
CH-1
SW922
CH-10
SW924
TU+
SW925
TU—
SW921
SET
CHANNEL PRESET
SW926
INPUT
SELECT

D TIMER C.B

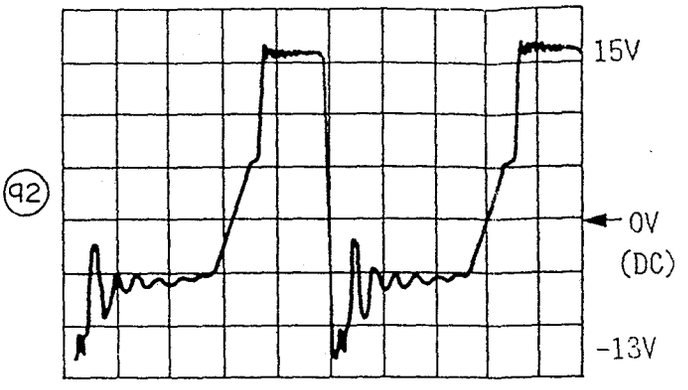

L902 100UH
C904 22/16
C905 0.047
REMOTE SENSOR
IC902 SBX1610-52
CN902
TU SCK 1
TU SO 2
TU SI 3
REEL PULSE 4
SI 5
SCK 6
SO 7
TU CS 8
TO B SERVO/SYSCON C.B WS209
CN901
REQ 1
READY 2
SYNC 3
P.ON 4
RESET 5
TR.MM 6
AUTO/MANUAL 7
AUTO TRACKING LED 8
TO B SERVO/SYSCON C.B WS208
HV-ÐK510MKII ONLY
EVER+5V
GNÐ
R910 47K
R909 47K
R908 47K
R907 47K
R917 10K
Ð940
R912 10K
R916 10K
R911 1K
Q901~908 ÐTC144ES BUFFER
Q901
Q902
Q903
Q904
Q905
Q906
Q907
Q908
Ð901~908, 910~920 922~934, 937 939~941 1SS133×36
SW902 Ð910 EJECT
SW903 Ð911 STOP
SW904 Ð912 PLAY
SW905 Ð913 REW
SW906 Ð914 F.FWÐ
SW907 Ð915 NOISE CANCEL
SW908 Ð916 REC
SW909 Ð917 QTR
SW910 Ð918 TIMER REC
SW911 Ð919 COUNTER RESET
SW912 Ð920 COUNTER MEMORY
SW914 Ð922 CLOCK/COUNTER
SW915 Ð923 PRGM/CHECK
SW916 Ð924 NEXT
SW917 Ð925 CLEAR
SW918 Ð926 TIME SET
SW919 Ð927 CH UP
SW920 Ð928 CH ÐOWN
SW921 Ð929 PRESET
SW922 Ð930 10
SW923 Ð931 1
SW924 Ð932 TUNNING +
SW925 Ð933 TUNNING -
SW926 Ð934 INPUT SELECT
SW931 Ð941 TEST
SW929 Ð937 BAND
TIMER MICROPROCESSOR IC901 UPÐ75208CW-A25
SERVICE TV/VCR EP LP KM3 KM2 KM1 KMO P.ON SYNC READY REQUEST BUZZER TUCS SO SCK SI 24H/12H REEL.P REMOTE CONT TUSI TUSO TUSCK TEST A B C D
GND EX PPO
EXT XT POWER LED RST
EVER-30V EVER-3V EVER+5V
-22.2
-27.4
POWER OFF:0
X901 4.19M
X902 32.768K
R903 1M
R920 1K
R901 150K
C901 22/16
C902 22/16
C903 0.047
C907 33/25
C909 12P(CH)
C906 22P(CH)
L901 100UH
Ð942 HZ9C1L
R906 68K
Q910 ÐTC144ES
SWITCH
A/M
TR.MM
BT903
113 (AC)
114 (ÐC)
R902 220
R904 10K
Ð939 LT3547B
SW930 ON
Q909 ÐTC144ES
OFF
RV901 250K
0.2 (POWER OFF:3.6)
2 (POWER OFF:5.1)
SW930, Ð939 AUTO TRACKING
HV-ÐK510MKII ONLY
TRACKING
FL ÐISPLAY (FL901)
g f b a h
(10G)
a b f g c e d h i
1 2 3 4 5 6 7 W EÐIT (4G)
REC TIMER
NEXT ON OFF AM PM
SU MO TU WE TH FR SA
SIMUL MEMO
VCR LINE QTR ÐEW
SP LP EP PAL SECAM CH
FL901 ÐISPLAY
J901 J901-1 J901-2
AUÐIO IN
VIDEO IN
R905 33K
RV902 10K
PICTURE
CON901
F/R A
F LINE A (X)
F LINE A (Y)
F/R V
F LINE V (X)
F LINE V (Y)
REG GNÐ
Y REG+5V
PICTURE CONT
CN903
EVER +5V
UNREG GNÐ
POWER LEÐ
BUZZER
KMO
SO
2 (POWER OFF:5)
X903 FKM22EP
Ð938 SLZ-38TC-02
POWER
R919 220
CN904
E
POWER SW C.B
Ð909 1SS133
SW901
TO A MAIN C.B PIN401
WAVE FORMS NO.
MODEL HV-ÐK510MKII
MODEL HV-ÐK910MKII

WAVE FORM－4 POWER UNIT WAVE FORM

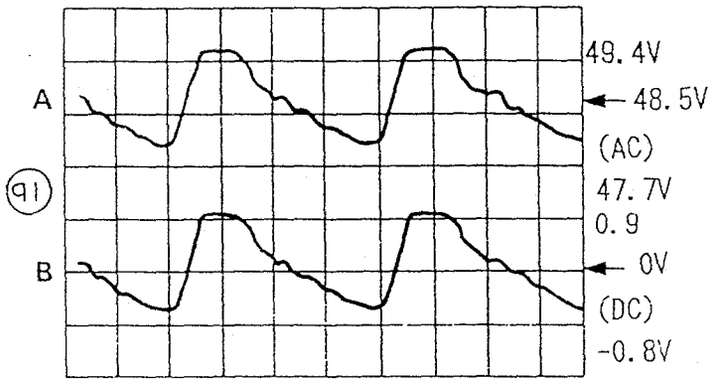
• HIC101 pin ② WAVE FORM
(T101 pin ④)
500Vp-p
200μs/div.



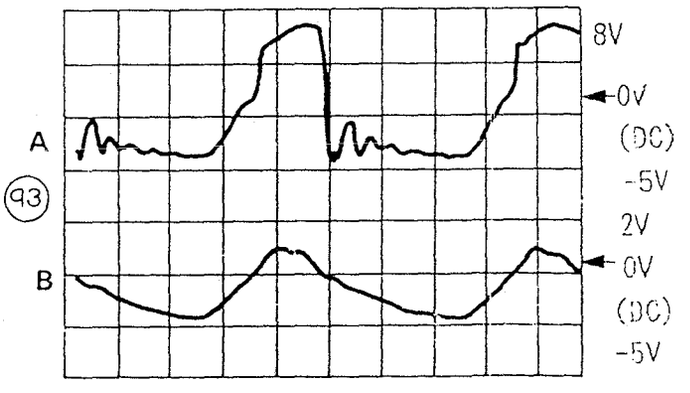
• T101 pin ⑤
5V/div.
2μs/div.



• C107 ⊕ SIDE (⑨1 -A)
1V/div.
2μs/div.
• C107 ⊖ SIDE (HIC101 pin ③)(⑨1 -B)
1V/div.
2μs/div.

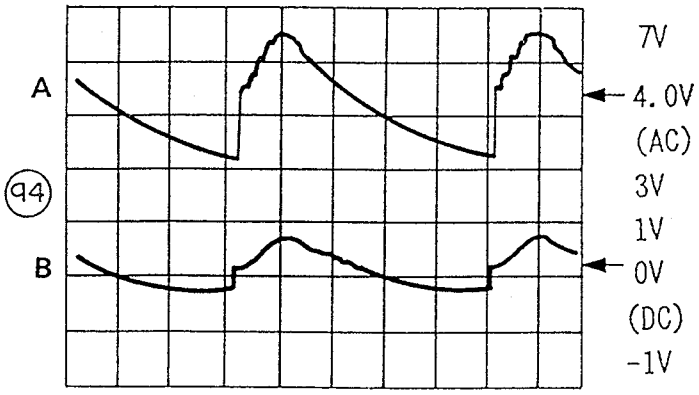


• D102 ANODE SIDE (⑨3 -A)
5V/div.
2μs/div.
• HIC101 pin ⑤ (⑨3 -B)
5V/div.
2μs/div.

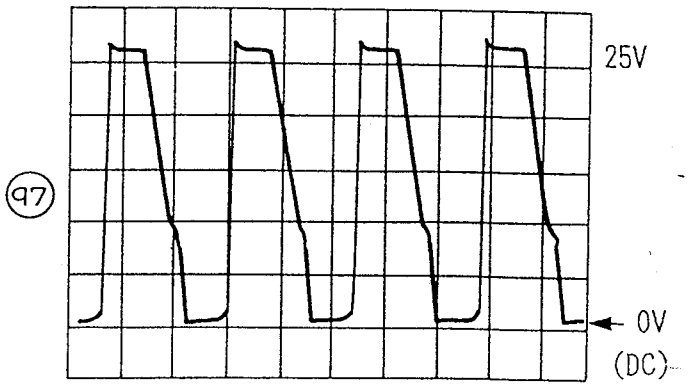


※ ◦ When checking waveforms (90) - (95), connect the negative (-) terminal of C104 to ground (GND on primary side).
◦ When checking waveforms (96) and (101), connect pin 2 of CON101 to ground (GND on secondary side).
◦ Waveforms should be measured in the PB mode and with AC 220V power input.

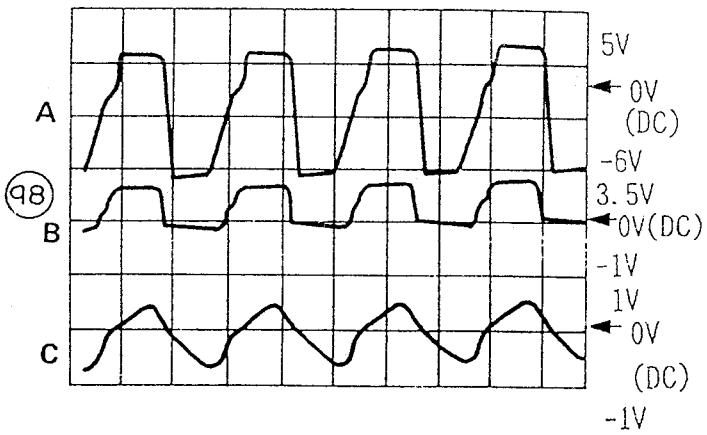
• D102 CATHOD SIDE (⑭ -A)
2V/div.
2μs/div.
• HIC101 pin ⑥ (⑭ -B)
2V/div.
2μs/div.



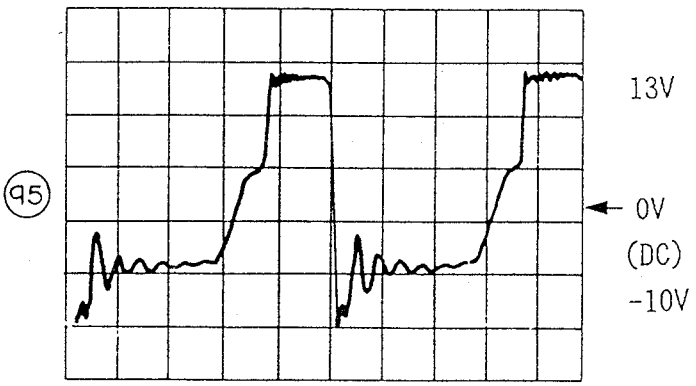
• Q301 COLLECTOR SIDE
5V/div.
2μs/div.



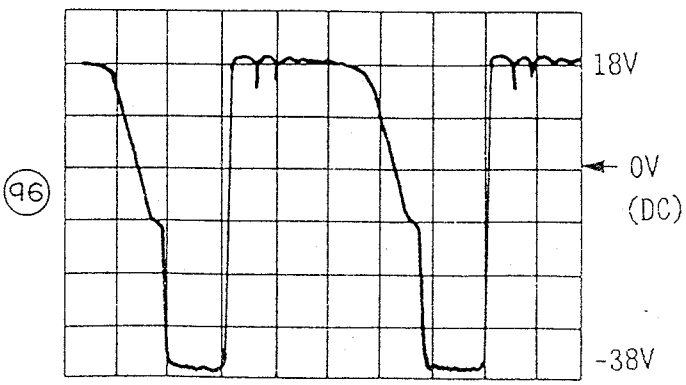
• T301 pin ⑥ (⑱ -A)
5V/div.
2μs/div.
• D302 CATHOD SIDE (⑱ -B)
5V/div.
2μs/div.
• D301 ANODE SIDE (⑱ -C)
2V/div.
2μs/div.



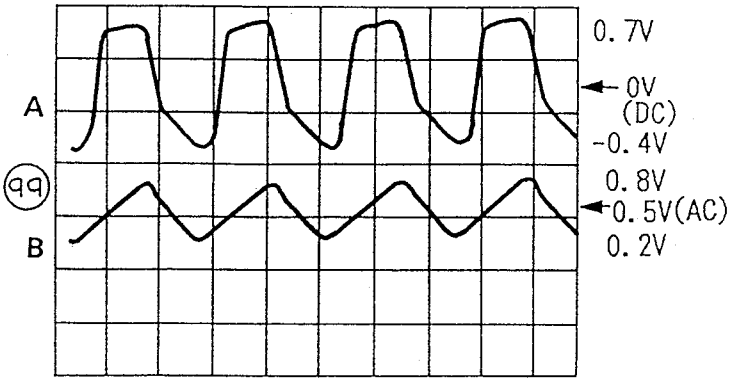
• HIC101 pin ⑦
5V/div.
2μs/div.



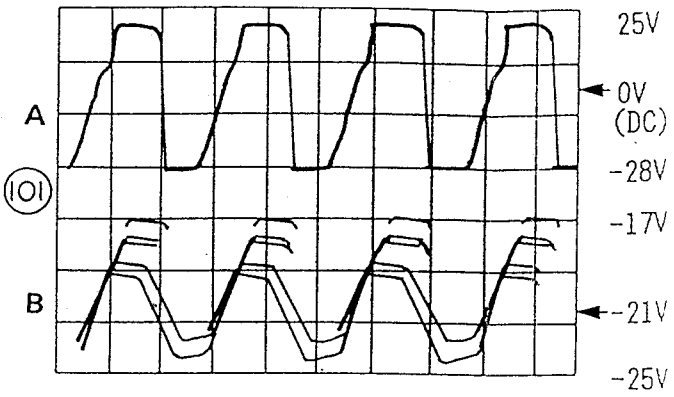
• T101 pin ⑪
10V/div.
2μs/div.



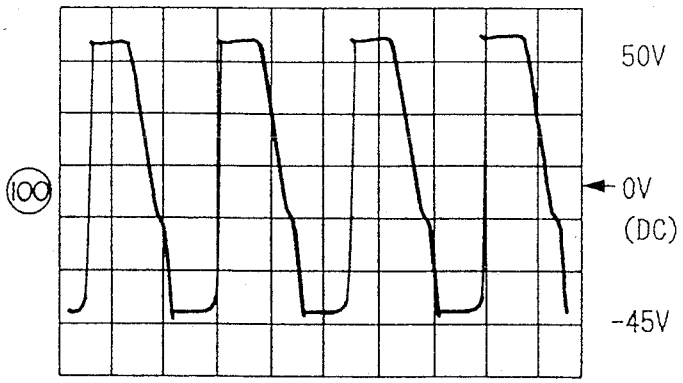
• Q301 BASE SIDE (⑨⑨ -A)
0.5V/div.
2μs/div.
• Q302 BASE SIDE (⑨⑨ -B)
0.5V/div.
2μs/div.



• T301 pin ⑧ (⑩① -A)
20V/div.
2μs/div.
• T301 pin ⑨ (⑩① -B)
2V/div.
2μs/div.

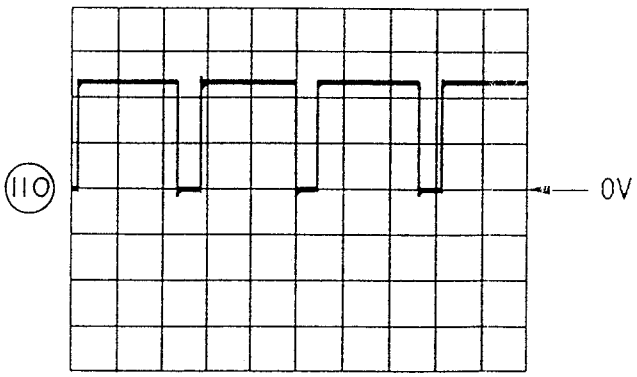


• D303 ANODE SIDE
20V/div.
2μs/div.

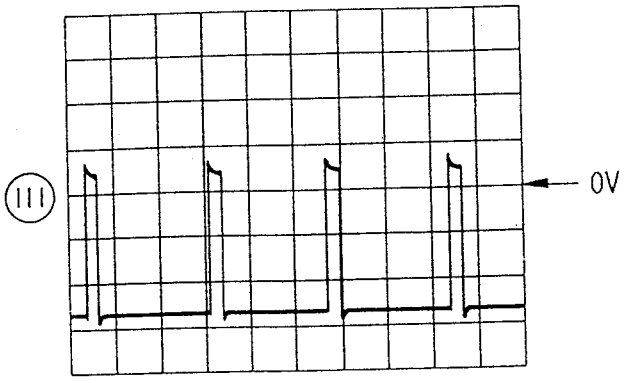


TIMER WAVE FORM

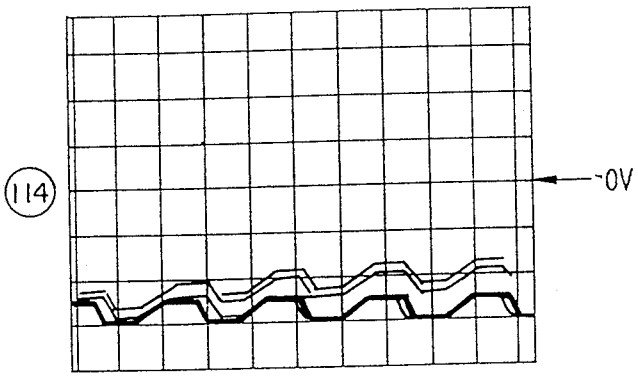
Q901 DTC144E Base
2ms/div.
2V/div.



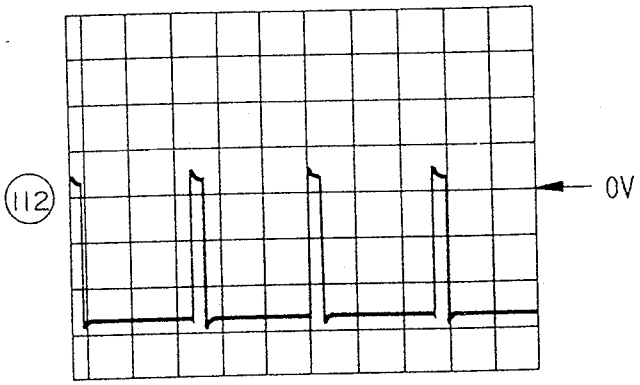
Anode voltage
IC901 pin (58) : S9
2ms/div.
10V/div.



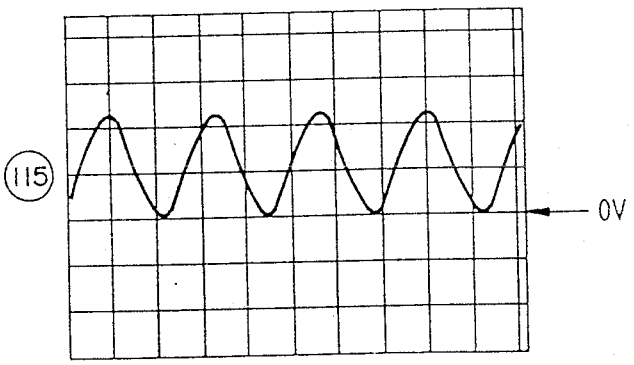
Filament voltage
CON902 pin (5) : AC 4V
DC range
2μs/div.
10V/div.



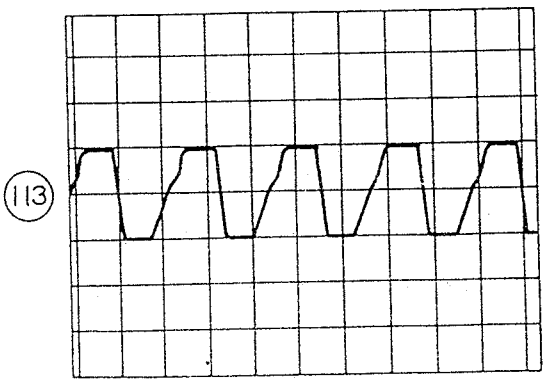
Grid voltage
IC901 pin (40) : TO
2ms/div.
10V/div.



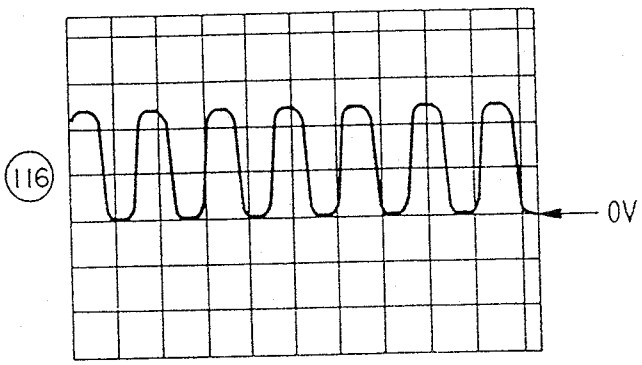
Main clock
IC901 pin (31) : X
4.19MHz
100ns/div.
2V/div.



Filament voltage
CON902 pin (5) : AC 4V
AC range
2μs/div.
5V/div.

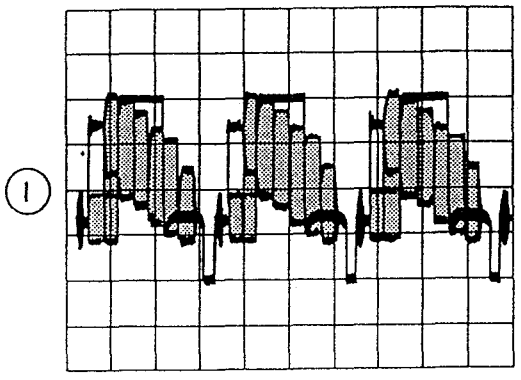


Sub-clock
IC901 pin (34) : XT
32.768kHz
20μs/div.
2V/div.

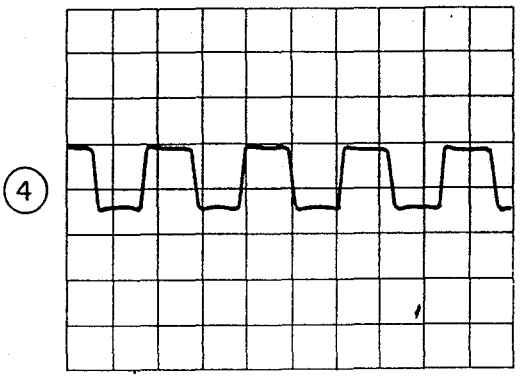


VIDEO WAVE FORM

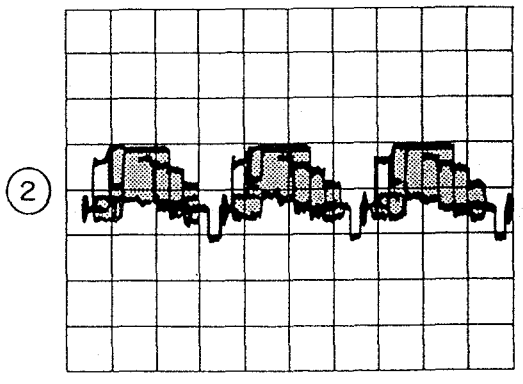
IC411 pin (21) (PB)
20μs/div.
500mV/div.
LINE OUT 75Ω TERMINATE



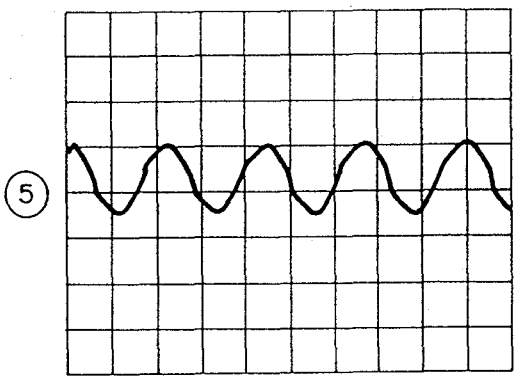
IC461 pin (18) (PB)
100ns/div.
500mV/div.



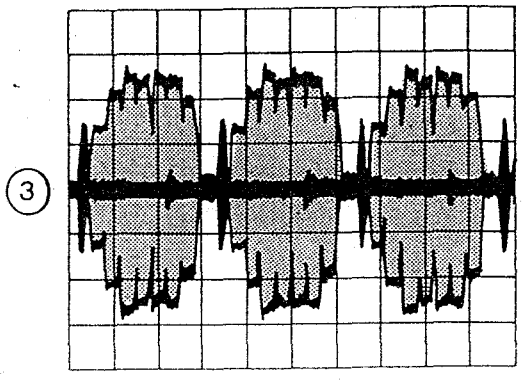
LINE OUT
20μs/div.
500mV/div.
LINE OUT 75Ω TERMINATE



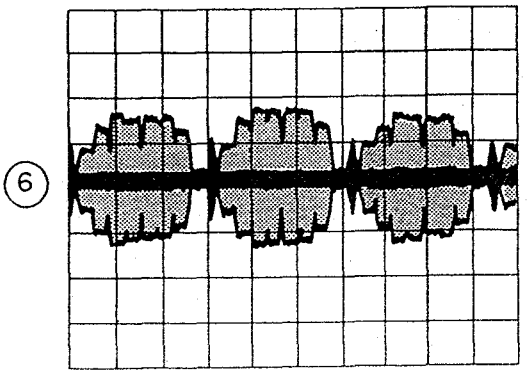
IC461 pin (19) (PB)
100ns/div.
500mV/div.



IC411 pin (19) (PB)
20μs/div.
100mV/div.

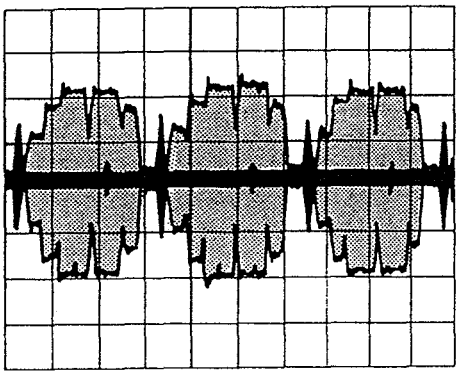


IC461 pin (5) (PB)
20μs/div.
500mV/div.



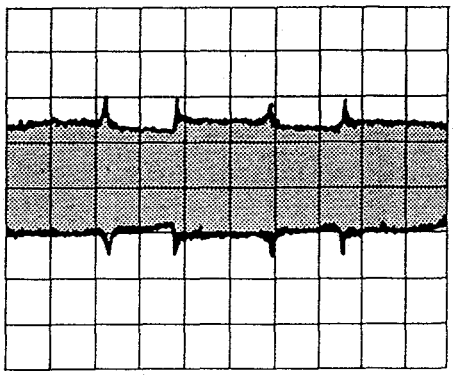
IC461 pin ③ (PB)
20μs/div.
50mV/div.

⑦



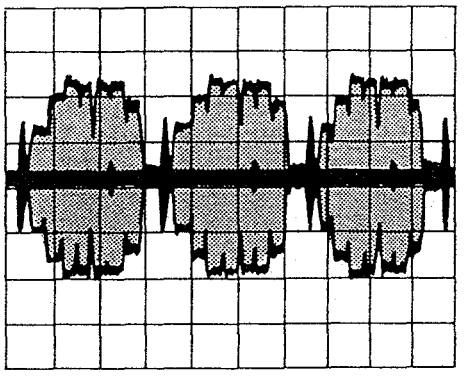
PIN402 pin ① (PB)
5ms/div.
100mV/div.

⑩



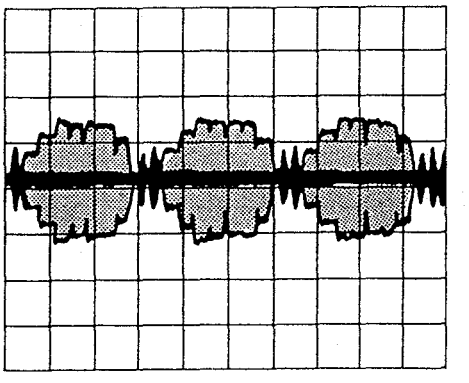
IC461 pin ㉔ (PB)
20μs/div.
50mV/div.

⑧



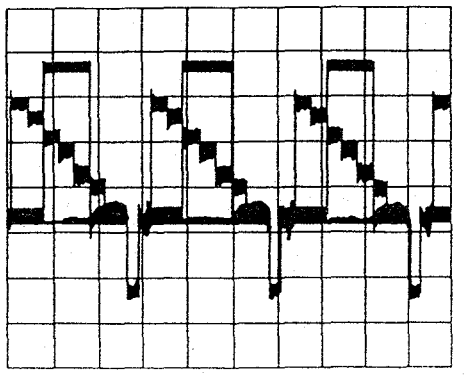
IC461 pin ⑦ (PB)
20μs/div.
100mV/div.

⑪



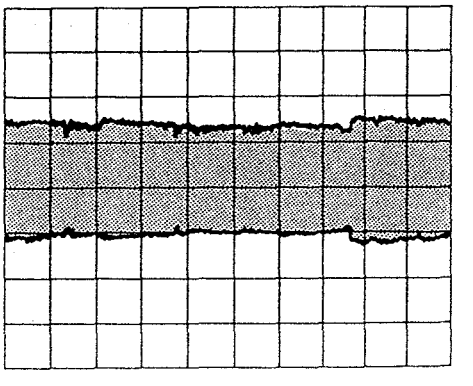
IC411 pin ⑨ (PB)
20μs/div.
100mV/div.

⑨



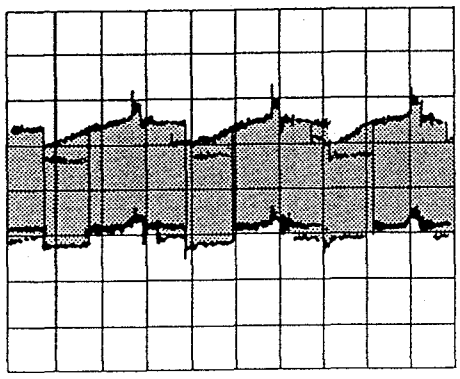
PIN402 pin ⑦ (PB)
5ms/div.
200mV/div.

⑫



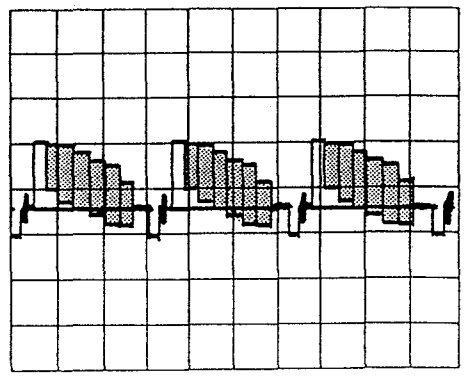
IC411 pin ⑦ (PB)
20μs/div.
500mV/div.

⑬



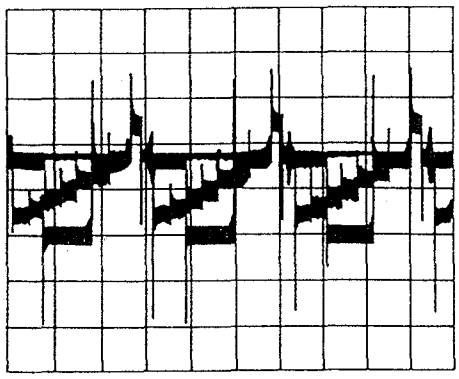
LINE OUT (EE)
20μs/div.
500mV/div.

⑯



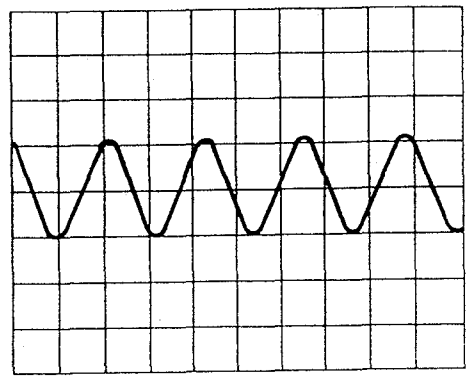
FIL411 OUT (PB)
20μs/div.
100mV/div.

⑭



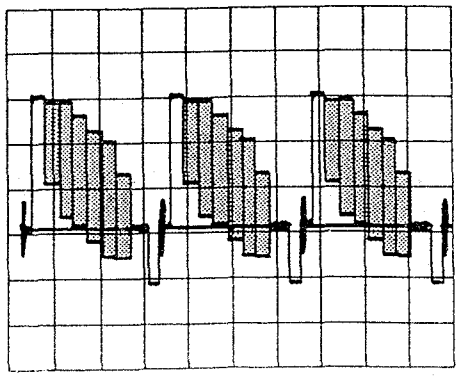
IC461 pin ⑲ (EE)
100ns/div.
500mV/div.

⑰



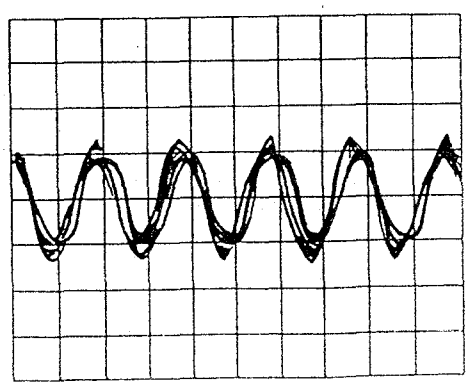
IC411 pin ㉑ (EE)
20ns/div.
500mV/div.

⑮



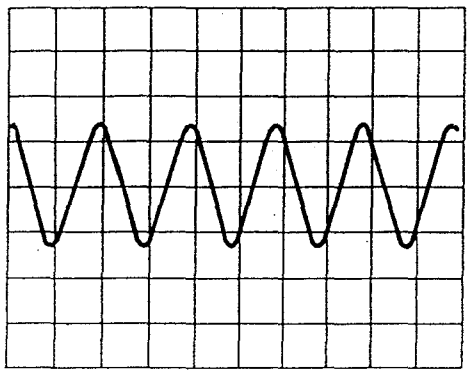
IC461 pin ⑬
100ns/div.
100mV/div.

⑱



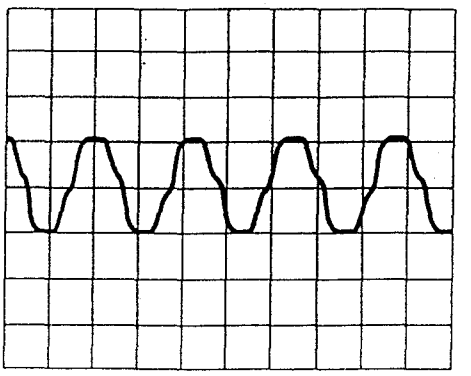
IC461 pin ⑪
100ns/div.
100mV/div.

⑲



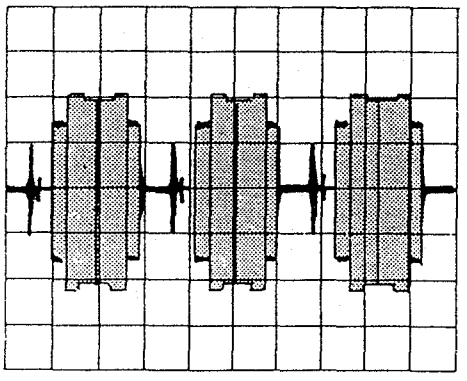
IC461 pin ⑱ (EE)
50mV/div.
100ns/div.

㉒



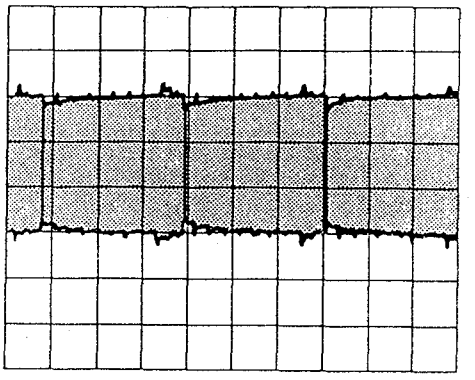
IC461 pin ⑨ (EE)
200mV/div.
20μs/div.

⑳



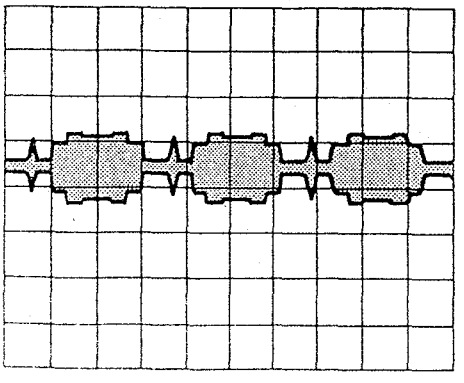
PIN402 pin ⑤ (EE)
100mV/div.
20μs/div.

㉓



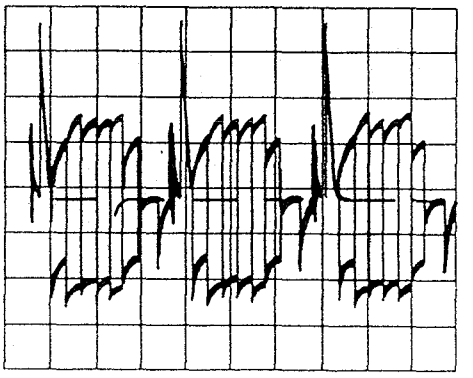
PIN402pin ③ (EE)
50mV/div.
20μs/div.

㉑



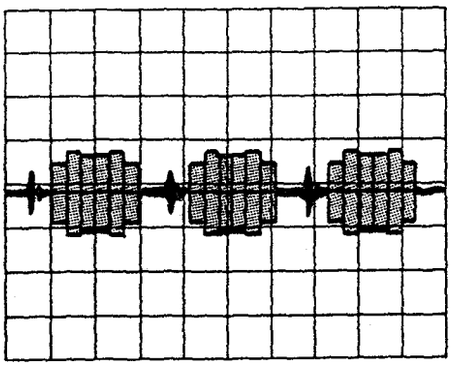
IC461 pin ⑤ (EE)
100mV/div.
20μs/div.

㉔



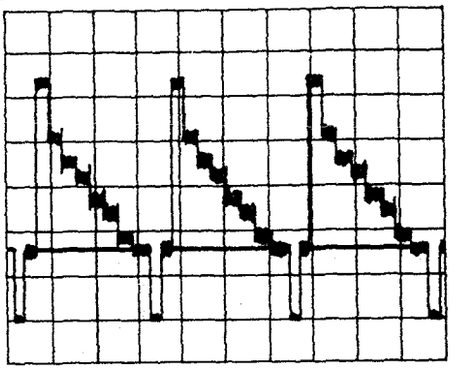
IC461 pin ③ (EE)
50mV/div.
20μs/div.

(25)



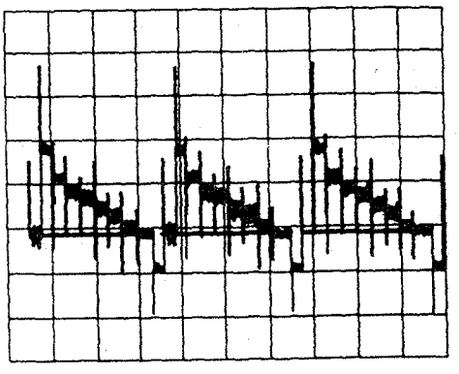
IC411 pin ⑥ (EE)
20μs/div.
100mV/div.

(26)



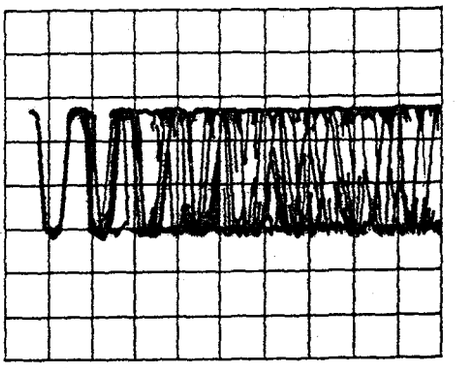
IC411 pin ② (EE)
20μs/div.
200mV/div.

(27)



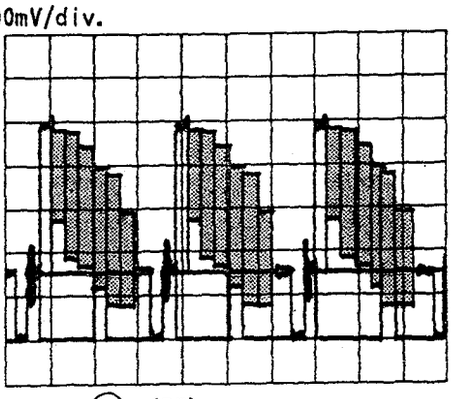
IC411 pin ㉚ (EE)
200ns/div.
500mV/div.

(28)



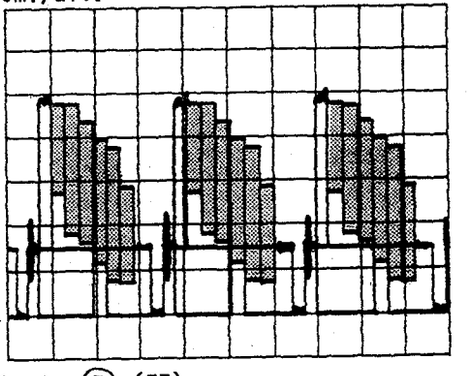
LINE IN (EE)
20μs/div.
200mV/div.

(29)



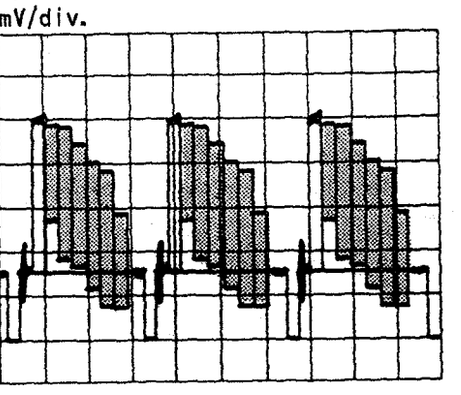
IC411 pin ㉔ (EE)
20μs/div.
200mV/div.

(30)



IC411 pin ⑦ (EE)
20μs/div.
200mV/div.

(31)



IC DESCRIPTION
IC,MB88525 – 205M (IC201)

Pin No.	Pin Name	I/O	Description	Active
1	TOP-SENSOR (START)	I	Receives the tape top (start) detection signal and A) Prevents the tape running in the reverse direction. B) Shifts the unit to the stop mode if this signal is input when the tape is running in reverse.	H
2	END-SENSOR	I	Receives the tape end detection signal and A) Prevents the tape running in the forward direction. B) Shifts the unit to the stop mode if this signal is input when the tape is running in forward.	H
3	RF-SWP	I	Receives drum rotation pulses. When pulses are not input for 2 seconds in a mode where the drum is rotating due to an abnormality in the tape or deck mechanism, the VCR enters the stop mode to protect the tape.	Pulse
4	REEL-SENSOR	I	Receives a signal from the reel sensor in the deck mechanism. When pulses are not input for 2 seconds in a mode where the reel is rotating due to an abnormality in the tape or deck mechanism, the VCR enters the stop mode to protect the tape.	Pulse
5	$\overline{\text{CASSETTE-OUT}}$	I	The CASSETTE OUT switch in the cassette loading mechanism is connected to detect the cassette-out state (eject). Instructs the cassette out operation (unloading) to stop.	L
6	$\overline{\text{CASSETTE-START}}$	I	The CASSETTE START switch in the cassette loading mechanism is connected to instruct the cassette-in operation (loading). When the input is detected during the cassette-out operation, the capstan motor is pulse driven.	L
7	$\overline{\text{CASSETTE-IN}}$	I	The cassette-in switch in the cassette loading mechanism is connected to detect the cassette-in state.	L
8	——	–	Unused (pulled up).	–
9	$\overline{\text{MODE SW 1}}$	I	These pins detect the position of the tape sledding mechanism.	H or L
10	$\overline{\text{MODE SW 2}}$	I		H or L
11	$\overline{\text{MODE SW 3}}$	I		H or L
12	$\overline{\text{MODE SW 4}}$	I		H or L
13	LP·EP-H	I	Tape speed detection inputs.	H
14	EP-H	I		H
15	MESECAM/$\overline{\text{PAL}}$	I	Video system discrimination inputs.	H or L
16	NTSC/$\overline{\text{PAL}}$	I		H or L
17	——	–	Unused (pulled up).	–
18	——	–	Unused (pulled up).	–
19	$\overline{\text{DEW-SENSOR}}$ (fixed at "H")	I	Receives a signal from the dew sensor circuit and prevents mechanical operation in the high humidity state.	L
20	$\overline{\text{REC-PROOF}}$	I	Detects the presence/absence of the mis-erasure prevention tab. "H" : No tab "L" : Tab	L

	NTSC/PAL	LP·EP-H	EP-H
SP	2H/3H	L	L
LP	4H/3H	H	L
EP	6H/6H	H	H

NTSC/$\overline{\text{PAL}}$	MESECAM/$\overline{\text{PAL}}$	MODE
H	※	NTSC
L	H	MESECAM
L	L	PAL

※ : DON'T CARE

<table>
<tr><th>Pin No.</th><th>Pin Name</th><th>I/O</th><th>Description</th><th>Active</th></tr>
<tr><td>21</td><td>——</td><td>–</td><td>Unused.</td><td>–</td></tr>
<tr><td>22</td><td>VCR/$\overline{TV}$</td><td>O</td><td>Switches the RF signal output of the VCR.
"H" : Built-in RF converter signal output
"L" : External antenna signal output</td><td>H or L</td></tr>
<tr><td>23</td><td>LINE/$\overline{TUNER}$
(AUDIO)</td><td>O</td><td>Switches the audio output.
"H" : Line input audio
"L" : Tuner audio</td><td>H or L</td></tr>
<tr><td>24</td><td>LINE/$\overline{TUNER}$
(VIDEO)</td><td>O</td><td>Switches the video output.
"H" : Line input video
"L" : Tuner video</td><td>H or L</td></tr>
<tr><td>25
26</td><td>EX
X</td><td>I
O</td><td>A ceramic oscillator which generates the system clock signal (6MHz) is connected to these pins.</td><td></td></tr>
<tr><td>27</td><td>$\overline{RST}$</td><td>I</td><td>System reset input.</td><td>L</td></tr>
<tr><td>28</td><td>——</td><td>–</td><td>Unused.</td><td>–</td></tr>
<tr><td>29</td><td>——</td><td>–</td><td>Unused (pulled up).</td><td>–</td></tr>
<tr><td>30</td><td>$\overline{SCK}$</td><td>I</td><td>Receives a pulse to time writing/reading of the serial data to/from the timer microprocessor.</td><td>Pulse</td></tr>
<tr><td>31</td><td>SI</td><td>I</td><td>Signal for receiving serial data from the timer microprocessor.</td><td>H or L</td></tr>
<tr><td>32</td><td>GND</td><td>–</td><td>GND.</td><td>–</td></tr>
<tr><td>33</td><td>SO</td><td>O</td><td>Signal to output serial data to the timer microprocessor.</td><td>H or L</td></tr>
<tr><td>34</td><td>$\overline{DRUM-ON}$</td><td>O</td><td>Drum motor rotation/stop control.</td><td>L</td></tr>
<tr><td>35</td><td>DELAYED-REC</td><td>O</td><td>Outputs "H" after the tape transport and the capstan speed are stabilized when the stop mode is switched to the record mode and the record pause mode is switched to the record mode, to instruct recording of a signal on the tape.</td><td>H</td></tr>
<tr><td>36</td><td>——</td><td>–</td><td>Unused.</td><td>–</td></tr>
<tr><td>37</td><td>A-MUTE</td><td>O</td><td>Mutes an audio signal.
A) Outputs "H" during trick play.
B) Outputs "H" for the specified period before and after the EE output is inverted to cut off the noise occurring when switching between the tape recording signal and EE signal (when the EE output is inverted).</td><td>H</td></tr>
<tr><td>38
39</td><td>CM-R
CM-F</td><td>O
O</td><td>Capstan motor rotation/stop and rotation direction control outputs.
<table>
<tr><th>CM-F</th><th>CM-R</th><th>State</th></tr>
<tr><td>L</td><td>L</td><td>Motor stopped</td></tr>
<tr><td>H</td><td>L</td><td>Rotates forward</td></tr>
<tr><td>L</td><td>H</td><td>Rotates in reverse</td></tr>
<tr><td>H</td><td>H</td><td>Braking stopped</td></tr>
</table></td><td>H or L
H or L</td></tr>
<tr><td>40
41</td><td>TLM-R
TLM-F</td><td>O
O</td><td>Tape sledding motor rotation/stop and rotation direction control outputs.
<table>
<tr><th>TLM-F</th><th>TLM-R</th><th>State</th></tr>
<tr><td>L</td><td>L</td><td>Motor stopped</td></tr>
<tr><td>H</td><td>L</td><td>Rotates forward</td></tr>
<tr><td>L</td><td>H</td><td>Rotates in reverse</td></tr>
<tr><td>H</td><td>H</td><td>Braking stopped</td></tr>
</table></td><td>H or L
H or L</td></tr>
</table>

Pin No.	Pin Name	I/O	Description	Active
42	CAPSTAN-SPEED·HOLD	O	Outputs "H" when the tape sledding motor moves among the REVERSE, PLAY and PINCH OFF positions accompanying the transition between PLAY and REVIEW from REC to REC PAUSE. Outputs "H" during STILL and PAUSE to hold the capstan speed so the capstan servo circuit can easily be returned to the play speed.	H
43	FF/REW	O	Outputs "H" during FF/REW, cassette-in and out operations and during unloading from PLAY to STOP. Controls the high-speed rotation of the capstan motor.	H
44	REV	O	Unused. Outputs "H" during REVIEW. Controls the review speed of the servo circuit.	H
45	CUE	O	Unused. Outputs "H" during CUE. Controls the cue speed of the servo circuit.	H
46	STILL-ADVANCE	O	Unused. Outputs "H" during STILL ADVANCE.	H
47	STILL/PAUSE	O	Unused. Outputs "H" during STILL, REC PAUSE and S-ADV.	H
48	PLAY	O	Unused. Outputs "H" during PLAY, STILL, CUE, REV and S-ADV.	H
49	REC	O	Unused. Outputs "H" during REC and REC PAUSE.	H
50	REW	O	Unused. Outputs "H" during REW and REV.	H
51	FF	O	Unused. Outputs "H" during FF and CUE.	H
52	——	—	Unused.	—
53	DELAYED-PLAY	O	Outputs "H" after the tape transport and capstan speed are stabilized when STOP is switched to PLAY and STOP is switched to STILL, to prevent picture distortion.	H
54	$\overline{\text{REQUEST}}$	O	Signal to request serial communications to the timer microprocessor.	L
55	$\overline{\text{READY}}$	O	Signal to inform the timer microprocessor that the standby for serial data reception is completed.	L
56	S·CLK	O	Outputs a pulse to time the writing of serial data to the servo IC.	Pulse
57	S·DAT	O	Signal to output serial data to the servo IC.	H or L
58	EE	O	Switches the video output between the external input signal and tape playback signal. "H" : External input signal "L" : Tape playback signal	H
59	——	—	Unused.	—
60	TRKG RST	O	Outputs a pulse of approx. 5ms when the POWER, EJECT or REC key is pressed to reset the tracking microprocessor.	H
61	JOG	O	Outputs "H" during CUE and REV.	H
62	$\overline{\text{SYNC}}$	I	Signal to synchronize serial communications with the timer microprocessor.	L
63	——	—	Unused.	—
64	EVER +5V	—	Positive power supply pin.	—

IC,UPC75208CW – A25 (IC901)

Pin No.	Pin Name	I/O	Description	Active
1	D	O	Anode and key matrix signals for the fluorescent display tube.	Pulse
2	C	O		
3	B	O		
4	A	O		
5	$\overline{\text{TEST}}$	I	Input for the test mode of the unit.	L
6	$\overline{\text{TUSCK}}$	I	Receives a pulse to time the writing/reading of serial data to/from the tuner microprocessor.	Pulse
7	TUSO	O	Signal to output serial data to the tuner microprocessor.	H or L
8	TUSI	I	Signal for receiving serial data from the tuner microprocessor.	H or L
9	$\overline{\text{REMOCON}}$	I	Remote control data input.	Pulse
10	REEL-PULSE	I	Receives a signal from the reel sensor in the deck mechanism. Receives reel pulses for the tape counter. When 4 pulses are input, the counter counts up by one step.	Pulse
11	24h/$\overline{\text{12h}}$	I	Switches the clock indication. "H" : 24 hours "L" : 12 hours AM/PM	H or L
12	SI	I	Signal to receive serial data from the mechanism microprocessor.	H or L
13	$\overline{\text{SCK}}$	O	Receives a pulse to time the writing/reading of serial data to/from the mechanism microprocessor.	Pulse
14	SO	O	Signal to output serial data to the mechanism microprocessor.	H or L
15	TUCS	O	Outputs a signal to request serial communications to the tuner microprocessor.	H
16	BUZZER	O	Output signal (approx. 2kHz) to drive the buzzer.	Pulse
17	$\overline{\text{REQUEST}}$	I	Receives a signal to request serial communications from the mechanism microprocessor.	L
18	$\overline{\text{READY}}$	I	Receives a signal from the mechanism microprocessor which signals that the standby for serial data reception is completed.	L
19	$\overline{\text{SYNC}}$	O	Signal to synchronize serial communications with the mechanism microprocessor.	L
20	P.ON	O	Controls the power supply circuit of the VCR. Power is turned on.	H
21	KM 0	I	Key matrix scan input.	Pulse
22	KM 1	I	Key matrix scan input.	Pulse
23	KM 2	I	Key matrix scan input.	Pulse
24	KM 3	I	Key matrix scan input.	Pulse
25	LP-H	I	Tape speed mode. Tape speed is LP.	H
26	EP-H	I	Tape speed mode. Tape speed is EP.	H
27	TV/VCR	I	Selects the indication in the fluorescent display of the VCR. "H" : Displays information. "L" : Does not display information.	H
28	$\overline{\text{SERVICE}}$	I	Input for the service mode of the VCR.	L
29	PPO	–	Unused.	–
30	EX	I	A ceramic oscillator which generates a main system clock pulse (4.19MHz) is connected.	
31	X	O		

Pin No.	Pin Name	I/O	Description	Active
32	GND	—	GND.	—
33	EXT	I	A crystal oscillator which generates a sub-system clock pulse (32.768KHz) is connected.	
34	XT	O		
35	POWER LED	O	Outputs "H" when power is turned on.	H
36	———	—	Unused.	—
37	———	—		—
38	———	—		—
39	$\overline{\text{RST}}$	I	System reset input.	L
40	G10	O	Grid signals of the fluorescent display tube.	Pulse
41	G9	O		Pulse
42	G8	O		Pulse
43	G7	O		Pulse
44	G6	O		Pulse
45	G5	O		Pulse
46	G4	O		Pulse
47	G3	O		Pulse
48	G2	O		Pulse
49	G1	O		Pulse
50	———	—	Unused.	—
51	———	—		—
52	———	—		—
53	———	—		—
54	———	—		—
55	———	—		—
56	EVER −30V	I	The pull-down resistors of the FIP controller/driver are connected.	
57	EVER −3V	I	Supplies power to the output buffer of the FIP controller/driver.	
58	J	O	Anode signals of the fluorescent display tube.	Pulse
59	I	O		Pulse
60	H	O	Anode and key matrix signals for the fluorescent display tube.	Pulse
61	G	O		
62	F	O		
63	E	O		
64	EVER +5V	—	Positive power supply.	—

IC,HD404302A06P (IC207)

Pin No.	Pin Name	I/O	Description
1	——	—	Unused (fixed at "H").
2	AUTO/$\overline{\text{MAN}}$	I	Auto tracking on/off signal ("H" in the AUTO Mode).
3	——	—	Unused (fixed at "H").
4	——	—	Unused (fixed at "L").
5	TR LED	O	Outputs pulses to make the LED flash during search in the auto tracking mode, and outputs "H" after auto tracking is completed.
6	TR MM	O	Outputs a delay timing pulse during auto tracking.
7	——	—	Unused.
8	C CONT 2	O	Outputs a noise feed pulse in the noise cancelling mode.
9	——	—	Unused.
10	$\overline{\text{TR CONT}}$	O	Outputs "L" during auto tracking to switch the TR MM circuit to the AUTO side.
11	$\overline{\text{D RST}}$	O	Outputs a reset pulse to detect the noise position in the noise cancelling mode.
12	——	—	Unused.
13	RF SW	I	RF SWP input.
14	——	—	Unused (fixed at "H").
15	CTL	I	CTL shaped wave form input.
16	——	—	Unused (fixed at "H").
17	——	—	Unused (fixed at "L").
18	——	—	Unused (fixed at "L").
19	M RF SW	I	RF SWP input.
20	DOC P	I	Noise position detection signal for the noise canceller.
21	GND	—	Power supply (GND).
22	A VCC	—	Power supply (+5V) of A/D converter.
23	V LEV	I	Input to detect the amplitude of the video signal during auto tracking (Analog DC).
24	——	—	Unused (fixed at "L").
25	——	—	Unused (fixed at "L").
26	——	—	Unused (fixed at "L").
27	A VSS	—	Power supply (GND) of A/D converter.
28	RESET	I	Reset input (goes "H" when reset).
29	——	—	Unused (fixed at "H").
30	EX	—	A clock generator is connected to these pins.
31	X	—	
32	VCC	—	Power supply (+5V).
33	——	—	Unused.
34	NTSC/$\overline{\text{PAL}}$	I	NTSC/PAL selection (fixed at "L").
35	——	—	Unused (fixed at "H").
36	——	—	Unused (fixed at "L").
37	JOG	I	"H" is input during CUE/REV.
38	PAUSE	I	Detects STILL ("H") and cancels noise.
39	MOD 1	I	These pins detect the tape speed mode.
40	MOD 0	I	
41	V PB	I	"H" is input during PLAY.
42	——	—	Unused.

IC,MN67481P (IC203)

Pin No.	Pin Name	I/O	Description
1	VDD	–	Power supply (+5V) of digital section.
2	TR MM	I	Tracking monostable multivibrator. Delay time constant for CTL locking position adjustment.
3	SDAT	I	Servo mode setting data input.
4	SCLK	I	Servo mode setting clock input.
5	RCLK	I	Reference timing clock for servo control (PAL : 4.433618MHz).
6	TEST	I	Unused (fixed at "L").
7	VLP	O	Artificial VD output (only durig CUE, REV and STILL).
8 9	MOD 0 MOD 1	O O	} Record mode output.

	MODE 0	MODE 1
SP mode 3H	"L"	"L"
LP mode 3H	"H"	"L"
EP mode 6H	"H"	"H"

10	RF SW P	O	RF SW P output (PAL : 25Hz).
11	PWM 2	O	Drum servo phase error output.
12	PWM 1	O	Drum servo speed error output.
13	PWM 3	O	Capstan servo speed error output.
14	PWM 4	O	Capstan servo phase error output.
15	VSS	–	Power supply (GND) of digital section.
16	YPG	I	Drum PG amplifier input.
17	YFG	I	Drum FG amplifier input.
18	FGI	I	Capstan FG amplifier input.
19	RI	I	Sets the reference neutral point voltage (+2.5V) of the internal linear amplifier.
20	VRO	O	Reference voltage (set by pin 19) output.
21	CI	I	CTL clamp input.
22	CO	O	CTL amplifier output.
23	CTLG	–	CTL amplifier GND.
24	CTLA	I	Sets the CTL amplifier gain (negative input terminal).
25	CTLH	I	CTL input.
26	A VDD	–	Power supply (+5V) of analog section.
27	V SYN	I	Vertical sync signal input.
28	PG MM	I	Switching position monostable multivibrator. Delay time constant for head switching point adjustment.

IC,UPD1730CT (IC881)

Pin No.	Pin Name	I/O	Description
1	OSC 1	I	4.5MHz ceramic oscillator input.
2	OSC 2	O	4.5MHz ceramic oscillator output.
3	PPO	O	D/A converter PWM output (tuning voltage).
4	CSYNC	I	H. sync pulse input (sync detection input).
5	AFT	I	AFT voltage input.
6	VDD	—	+5V power supply.
7	——	—	Unused.
8	AUS	I	Signal to select the destination, Australia.
9	CS	O	E^2PROM chip select.
10	EUSI	I	E^2PROM serial data input.
11	EUSO	O	E^2PROM serial data output.
12	TUSO	O	Serial data output (input to the tuner).
13	TUCS	I	Data transfer trigger.
14	GND	O	GND.
15	POWER ON	I	POWER key signal.
16	——	—	Unused.
17	$\overline{\text{AFTC}}$	O	AFT control.
18	AFTC	O	AFT control.
19	TUMU	O	Goes "H" when muting a singnal.
20	TUMTC	O	Goes "L" when H. sync pulse is detected.
21	——	—	Unused.
22	——	—	Unused.
23	GND	—	GND.
24	$\overline{\text{RESET}}$	I	Goes "H" at the program start.
25	TUSI	I	Serial data input (output from the tuner).
26	$\overline{\text{TUSCK}}$	O	Serial data clock.
27	$\overline{\text{ROMCLK}}$	O	E^2PROM clock.
28 29	BAND 1 BAND 2	O O	} These pins assign the tuner band.

BAND	BAND1	BAND2
VH	1	0
VL	0	1
U	1	1

30	——	—	Unused.

CIRCUIT DESCRIPTION
1. AUTO TRACKING

When the VCR is in a play mode other than the JOG (CUE/REV) and STILL modes, this function operates by turning AUTO TRACKING on (IC207 pin②: High).

〔Function devices〕

IC207, Q450, Q451, Q210, Q211, Q212 and peripheral capacitors and resistors.

〔Principle〕

The tracks are traced so that the CTL signal (which is delayed = TR MM) is servo-locked during play. However, the CTL heads have tolerances within the specification in different mechanisms, therefore, TR MM (tracking control) is adjusted with ordinary VCRs and the CTL signal is set to the optimum position.

The auto tracking function detects the level of the signals output from the video heads and sets the delay from the CTL signal so that the level is maximum.Auto tracking is performed through the following three processes.

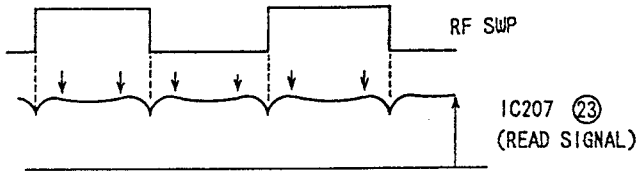
1. Search ... Detects the position where the level is maximum.
2. FIX ..... Fixes the delay so that the level is optimum.
3. Monitoring the change ... Detects whether or not the recording state was changed, and if a change is detected, searching re-started.

〔Operation〕

1. Search
   a. When a cassette is loaded and the VCR first enters the play mode.
   b. When the recording state was changed and the head output level changes (change of ±1/8 or more from the design value).
   c. When there are non-signal recorded sections and recorded sections due to a change of recording state.

   When the auto tracking circuit detects one of the following items, a, b and c, it performs searching and controls the delay from the CTL signal in steps so that the head output level is maximum.

Since the read levels vary as shown in the diagram below due to different rotation angles of the drum heads, the read timing is specified from RF SWP and the average read data is detected to improve reliability.



(↓ ····Sampling the read data)

2. Fixing

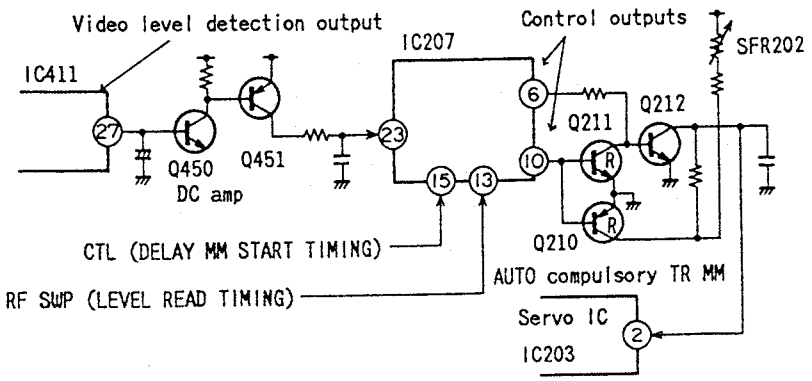
The delay is varied by the auto compulsory tracking MM (Q210, Q211, Q212) and the signal levels at each delay time are read. When the maximum level is detected, it is stored in memory and the delay is fixed.

The data of the tape with which search is completed is stored until ejection of power off is performed and the VCR enters the AUTO mode at the start of play without passing through search even when the stop mode is entered.

3. Monitoring of changes

The auto tracking circuit always monitors an abnormality even if the delay is fixed in the AUTO mode, and if any change occurs, it repeats search to adjust the tracking for the best.

(Note) The LED does not light in the following case even if the auto tracking switch is turned on.
When a tape with no signal recorded on it is played.
(presence/absence of CTL signal)



2. AUTO NOISE CANCELLER

When the STILL button is pressed during play, the auto noise canceller drives noise bars out of the screen so that they are not visible.

〔Function devices〕

IC207, IC209, Q213, Q214

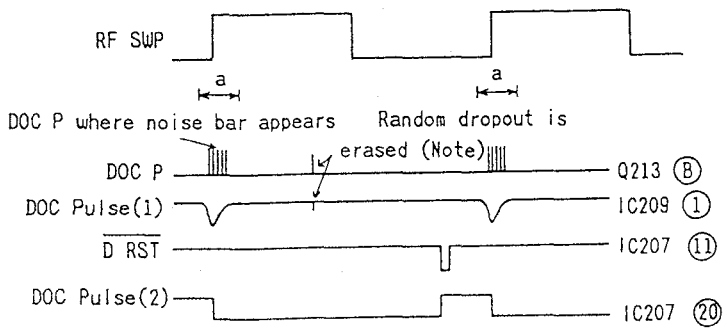
〔Conditions〕

IC207 determines whether the auto cancelling function should be operated or not and executes operation.

1. IC207 (41) High (PB)
2. IC207 (38) High (PAUSE)

〔Principle〕

The position of the noise bar can be known from the DOC P waveform in the video circuit. If the DOC P waveform is in area (a) of the RF SWP pulse as shown in the diagram below, the noise bar is not visible on the TV screen. The following DOC P pulse is produced so that IC207 (microprocessor) can read it easily.



1. When the trailing edge of the DOC P Pulse is within range (a) in the STILL mode, the cancelling operation is not necessary.
2. When it is out of range (a), the pulse which turn the capstan motor minutely are generated at pin 8 of IC207.
3. When the tape is fed minutely and the trailing edge of the DOC P pulse enters area (a), the generating of pulses is stopped.

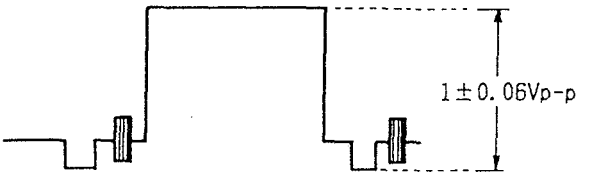
The DOC pulse moves to the right with reference to the RF SWP pulse in steps 2 and 3.

(Note) When tapes with large random dropouts are used, the random dropouts and DOC pulses cannot be discriminated and the unit performs the detection erroneously.

ELECTRICAL ADJUSTMENT

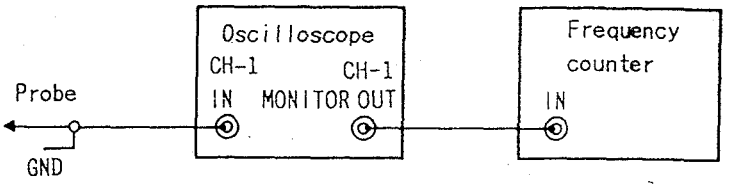
Preparation for adjustment

Input signal (100% white)

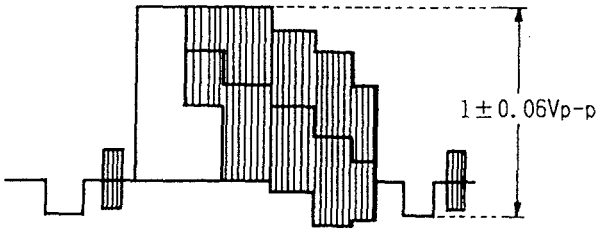


※Note : Voltage measured with a signal generator connected to the VCR

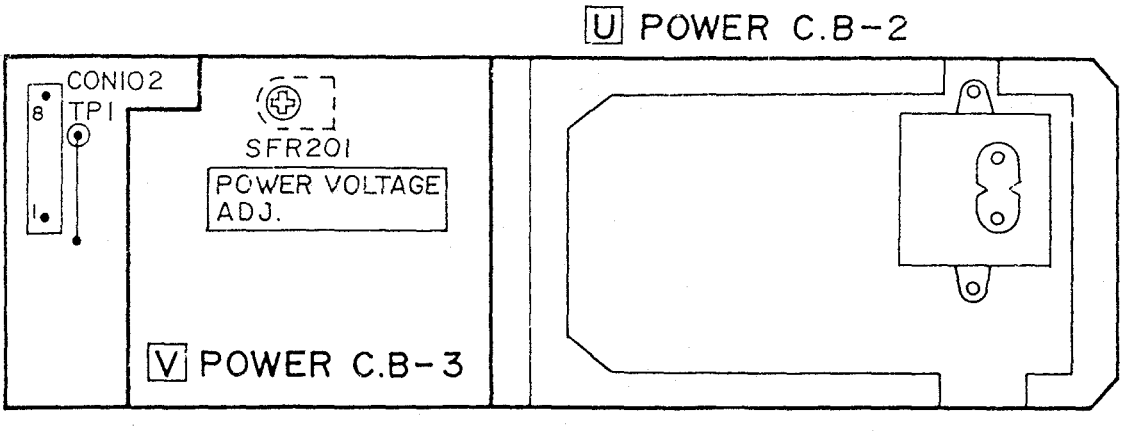
Connections of test equipment



Input signal (color bar)



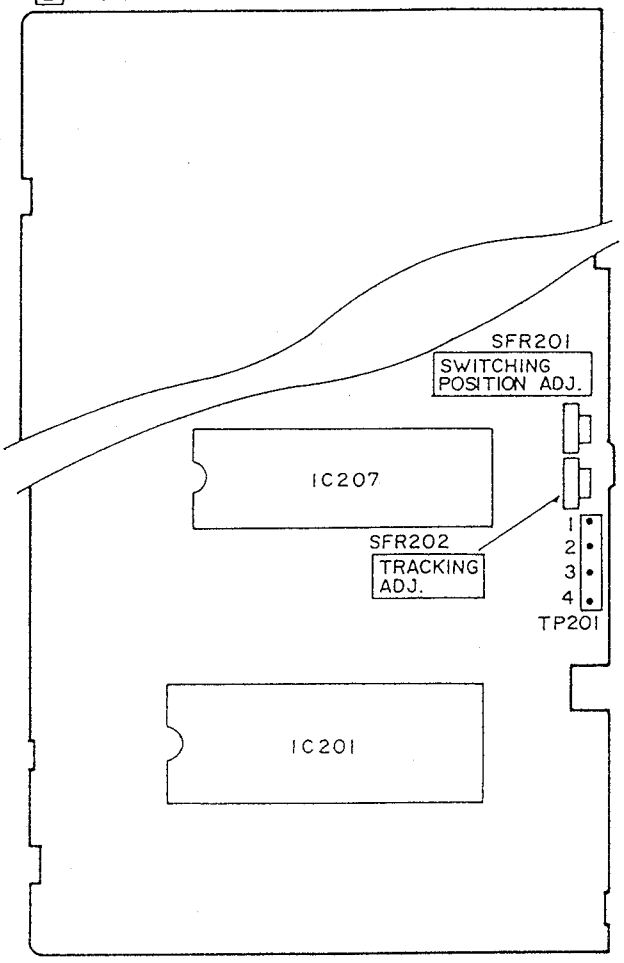
※Note : Voltage measured with a signal generator connected to the VCR



1.Power voltage adjustment (U POWER C.B-2)

1) Connect a digital tester between pin 5 (TP1) of CON102 on the main circuit board and ground.
2) Adjust SFR201 on the POWER C.B-2 so that the voltage is 12.2V±0.1V.

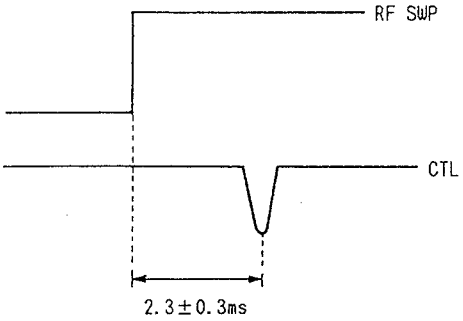
[B] SERVO/SYSCON C.B (COMPONENT SIDE)



2.Servo circuit adjustment

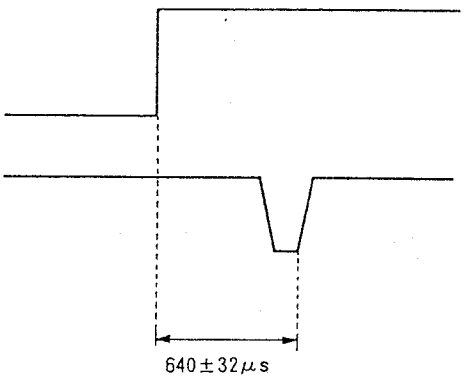
(1) Tracking Adjustment ([B] SERVO/SYSCON C.B)
Oscilloscope CH-1 : TP201 pin (2) (RF SWP)
CH-2 : TP201 pin (1) (CTL)

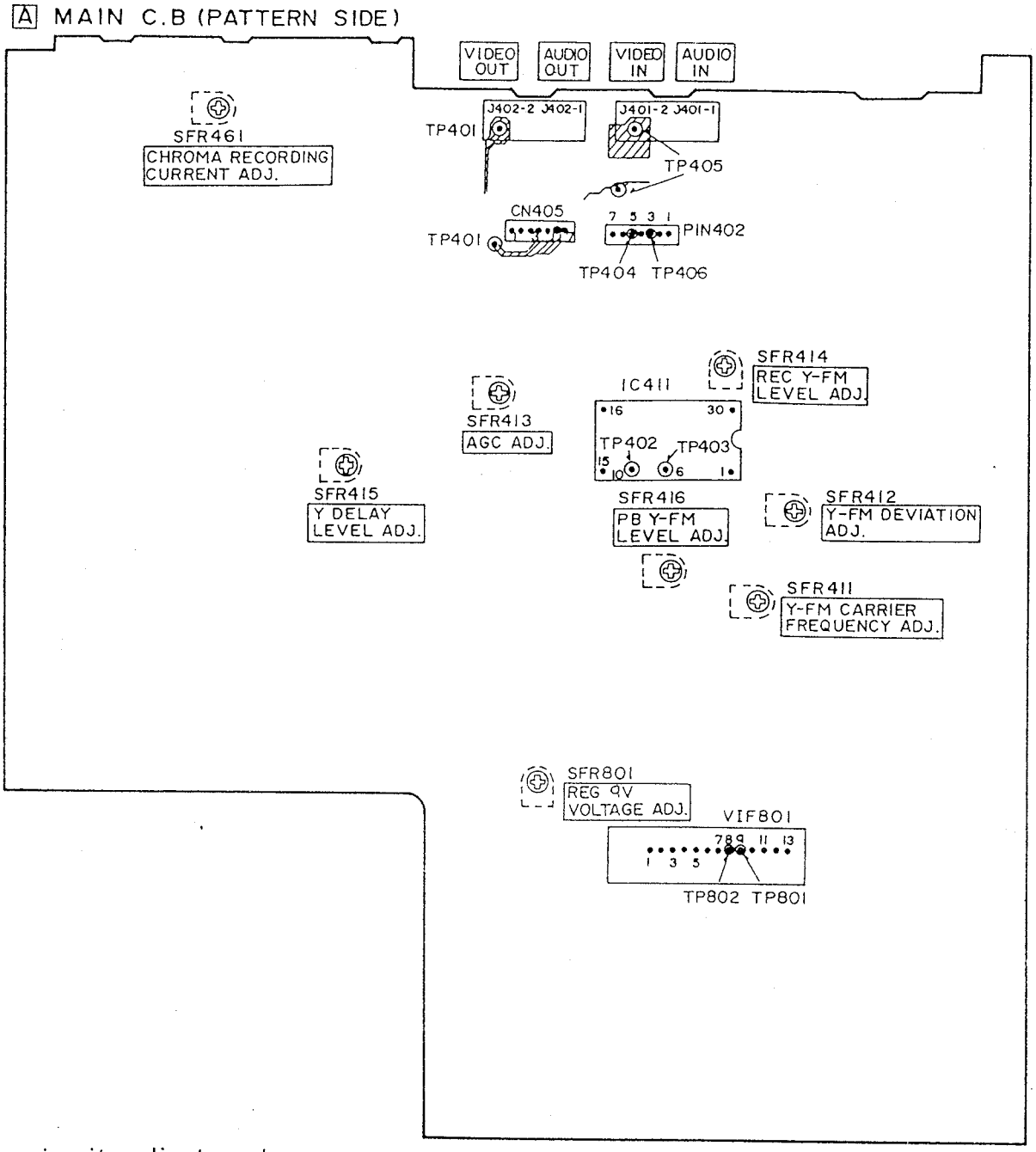
1) Set the VCR to the manual tracking mode.
2) Set RV901 (tracking VR) to the center position.
3) Play alignment tape TTV-P1.
4) Adjust SFR202 so that the position of the CTL signal is as shown in the figure below.



(2) Switching Position Adjustment ([B] SERVO/SYSCON C.B)
Oscilloscope CH-1 : TP201 pin (2) (RF SWP)
CH-2 : TP201 pin (3) (V SYNC)

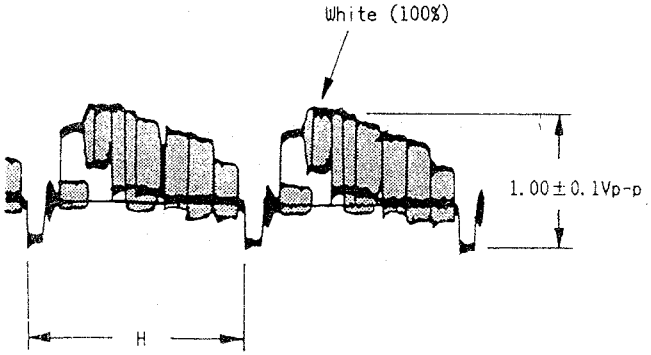
1) Set the VCR to the manual tracking mode.
2) Set RV901 (tracking VR) to the center position.
3) Play alignment tape TTV-P1.
4) Adjust SFR201 so that the V. SYNC signal is as shown in the figure below.



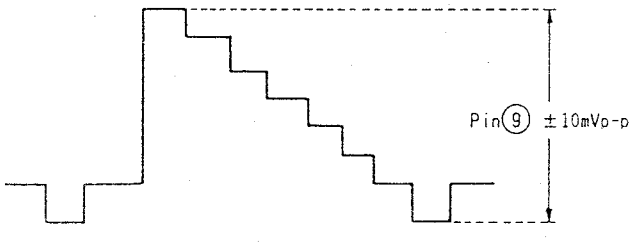


3.Video circuit adjustment

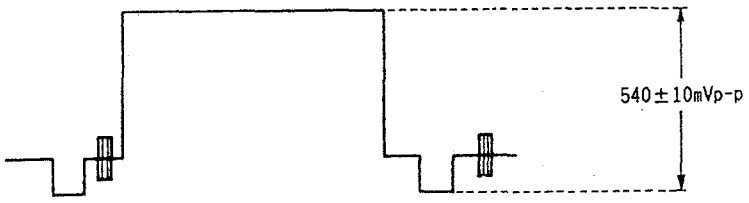
(1) PB Y-FM Level Adjustment (A MAIN C.B)
Oscilloscope : VIDEO OUT (TP401)
1) Play alignment tape TTV-P1.
2) Adjust SFR416 so that the white 100% level is as shown in the figure below.
※Terminate the VIDEO OUT jack with 75ohms or connect a monitor to it.



(2) Y Delay Level Adjustment (A MAIN C.B)
Oscilloscope : IC411 pin (10) (TP402)
1) Play alignment tape TTV-P1.
2) Adjust SFR415 so that the level at pin (10) of IC411 is the same as that of the waveform at pin (9) of IC411.

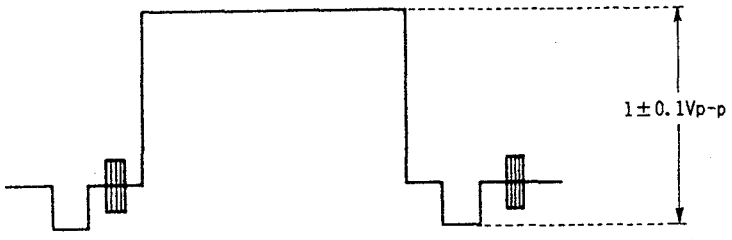


(3) AGC Adjustment (A MAIN C.B)
Oscilloscope : IC411 pin ⑥ (TP403)
1) Switch the input selector to LINE.
2) Apply a 100% white signal to the VIDEO IN jack.
3) Adjust SFR413 so that the Y signal is as shown in the figure below in the E-E mode.

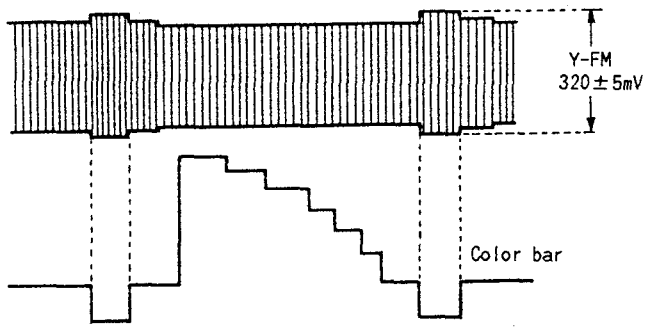


(4) Y-FM Carrier Frequency Adjustment (A MAIN C.B)
Oscilloscope : PIN402 pin ⑤ (TP404)
1) Switch the input selector to LINE.
2) Set the VCR to the no signal input state (with no input connected to the VIDEO IN jack).
3) Set the VCR to the E-E mode.
4) Adjust SFR411 so that the frequency counter reads 3.8MHz±0.05MHz.

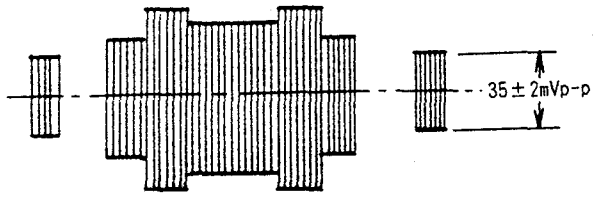
(5) Y-FM Deviation Adjustment (A MAIN C.B)
※The Y FM carrier frequency adjustment should have been completed.
Oscilloscope : VIDEO OUT (TP401)
1) Switch the input selector to LINE.
2) Record a 100% white signal.
3) Play the recorded section and check the Y signal level.
4) IF out of specification turn SFR412.
5) Repeat 2)~4) until observe the waveform as indicated below.
※Terminate the VIDEO OUT jack with 75ohms or connect a monitor to it.



(6) REC Y-FM Level Adjustment (A MAIN C.B)
Oscilloscope CH-1 : PIN402 pin ⑤ (TP404)
CH-2 : VIDEO IN (TP405)
1) Switch the input selector to LINE.
2) Apply a color bar signal or 100% white signal to the VIDEO IN jack.
3) Adjust SFR414 so that the synchro signal level of the Y FM level is as shown in the figure below in the E-E mode.

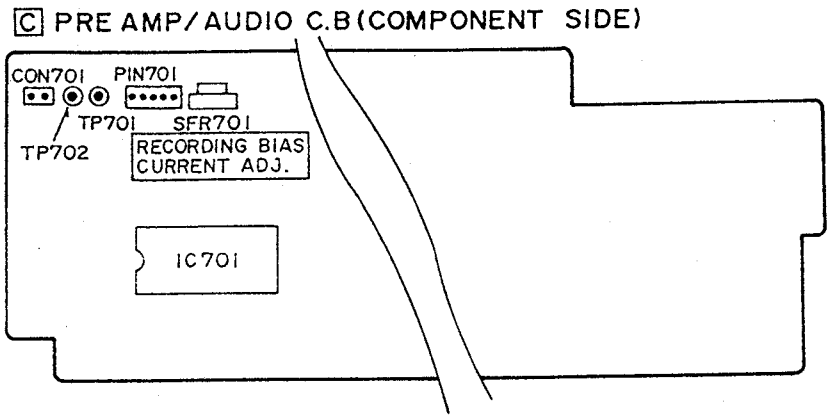


(7) Chroma Recording Current Adjustment (A MAIN C.B)
Oscilloscope : PIN402 pin ③ (TP406)
1) Switch the input selector to LINE.
2) Apply a color bar signal to the VIDEO IN jack.
3) Set the VCR the record mode and adjsut SFR461 so that the burst level is as shown in the figure below.



4.Tuner section adjustment

(1) REG 9V Voltage Adjustment (A MAIN C.B)
Digital voltmeter Positive terminal : VIF801 pin ⑨ (TP801)
Negative terminal : VIF801 pin ⑧ (TP802)
Adjust SFR801 so that the voltage is within the specification, 9.00±0.05V.



5.Audio circuit adjustment

(1) Recording Bias Current Adjustment (C PRE AMP/AUDIO C.B)

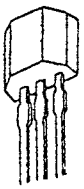
VTVM HOT terminal : TP701

GND terminal : TP702

1) Switch the input selector to LINE.
2) Set the VCR to the no signal input state (with no input connected to the LINE AUDIO IN jack).
3) Set the VCR to the record mode and adjsut SFR701 so that the bias level is within the specification, 22±1mVRMS.

TRANSISTOR ILLUSTRATION

2SA933
2SC1740
2SC2002
2SC3940

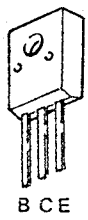


DTA144
DTC144

2SA1048

UN4211

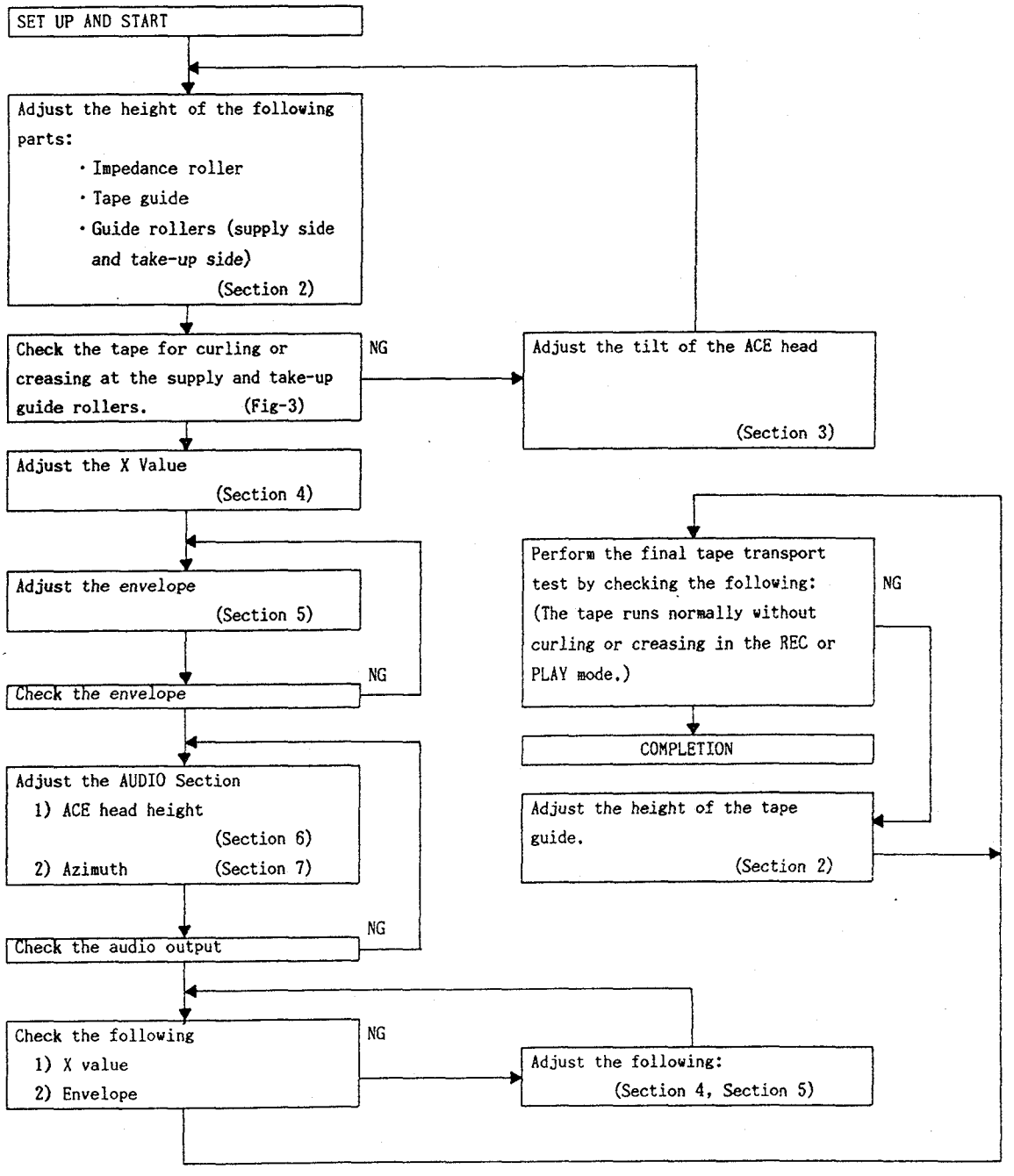
2SB733



2SC4148

5. MECHANICAL ADJUSTMENT

1. TAPE TRANSPORT ADJUSTMENT FLOWCHART

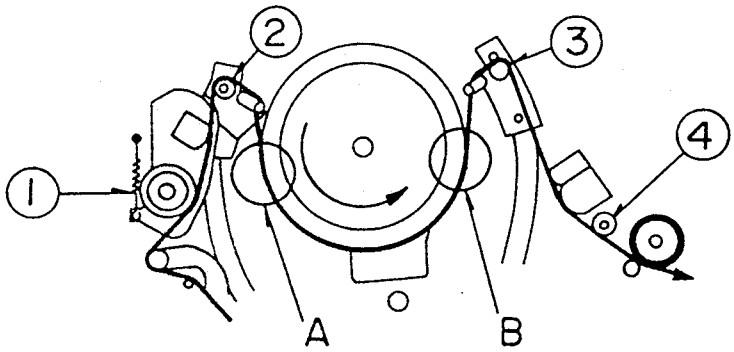

SET UP AND START
Adjust the height of the following parts:
• Impedance roller
• Tape guide
• Guide rollers (supply side and take-up side)
(Section 2)
Check the tape for curling or creasing at the supply and take-up guide rollers. (Fig-3)
NG
Adjust the tilt of the ACE head
(Section 3)
Adjust the X Value
(Section 4)
Adjust the envelope
(Section 5)
Check the envelope
NG
Adjust the AUDIO Section
1) ACE head height
(Section 6)
2) Azimuth (Section 7)
Check the audio output
NG
Check the following
1) X value
2) Envelope
NG
Adjust the following:
(Section 4, Section 5)
Perform the final tape transport test by checking the following:
(The tape runs normally without curling or creasing in the REC or PLAY mode.)
NG
COMPLETION
Adjust the height of the tape guide.
(Section 2)

2. TAPE RUNNING POSITION ADJUSTMENT
(GUIDE ROLLER/TAPE GUIDE/IMPEDANCE ROLLER)

Set-up

Lift the "Main circuit board".

1. Perform the height adjustment for the following items to obtain the proper tape running position. (See Figure-1)
   - ① Impedance roller
   - ② Guide roller (Supply side)
   - ③ Guide roller (Take-up side)
   - ④ Tape guide



Fig—1

2. Load a blank tape and set it to the PLAY mode. Check the tape transport at points "A" and "B" as shown in Fig-1.

3. Operate it between the PLAY and STOP modes several times.

4. Observe the tape transport at the "Lead surface of the cylinder" during the PLAY mode, and confirm that the tape runs smoothly along the "Lead surface of the cylinder" without slipping downward or upward. (See Figure-2)

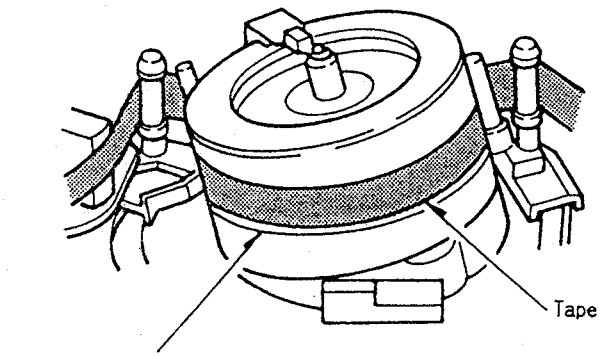


Fig-2

5. During loading, play and unloading, observe the tape at the supply and take-up "Guide rollers", "Tape guide" and "Impedance roller". Confirm that there is no curling or creasing etc., as shown in Fig-3.

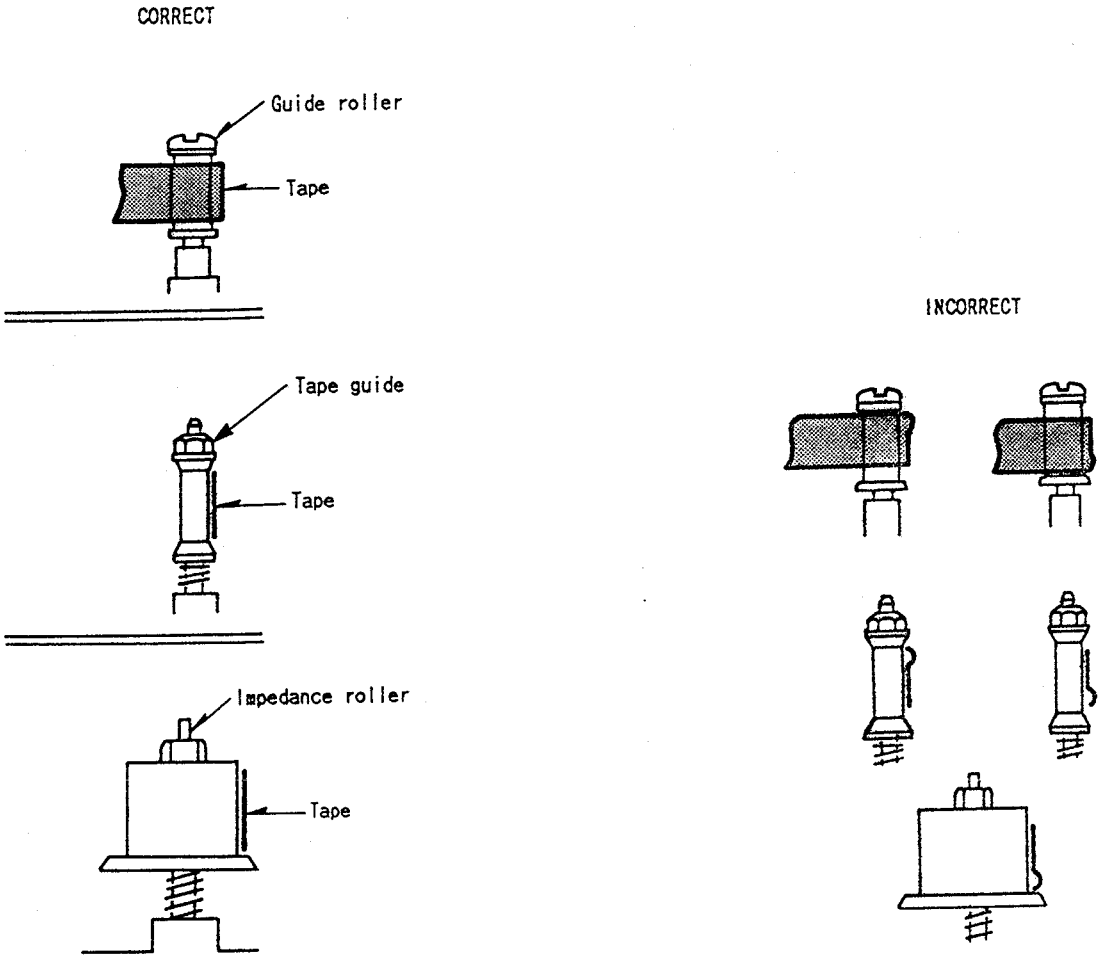


Fig-3

6. If any curling or creasing is noted, adjust "Tape guide roller" and "Impedance roller" first. In this case, adjust the "Impedance roller" in both PLAY and REV modes so that the tape runs as shown in Fig-4.

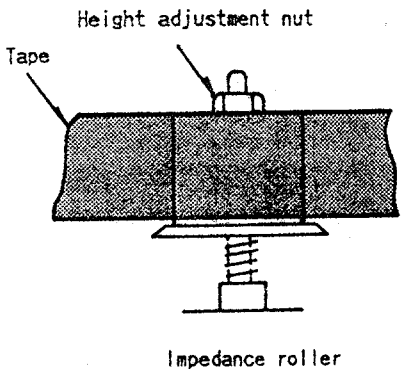


Fig-4

7. Next, adjust the "Guide roller" height. Insert the adjustment driver (J2) into the "Guide roller" top. (See Figure-5)
Adjust the height by turning the driver slightly so that the tape runs on the "Guide roller" as shown in Fig-3, and the lower edge of the tape runs along the "Lead surface of the cylinder".

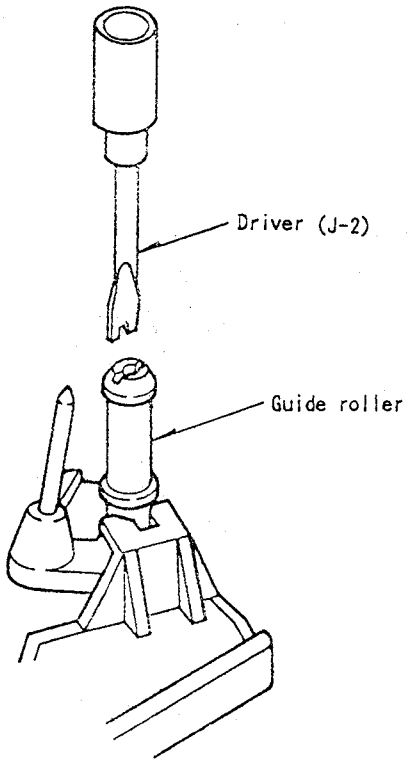
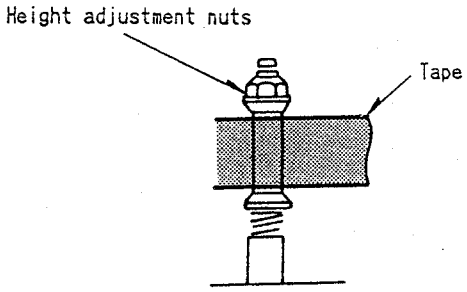


Fig-5



Tape Guide

Fig-6

8. After completion of the supply side "Guide roller" adjustments, adjust "Tape guide" so that tape runs as shown in Fig-6 and adjust the take-up side "Guide roller" by using the same procedures as for the supply side adjustments.
In this case, adjust the "Guide roller" height first.

9. Confirm that there is no curling or creasing at the "Impedance roller" (Both PLAY and REV modes). If there is any curling or creasing at the "Impedance roller", adjust the same procedures of Fig-6.

10. Finally, confirm that there is no curling or creasing at the take-up side guide roller and tape guide. If there is any curling or creasing between the take-up side "Guide roller" and the "ACE head", adjust the "ACE head".

3. ACE HEAD ADJUSTMENT

1. Load a recorded tape and set the it to PLAY mode.

2. Adjust the height of the edge of the "Audio track" on the "Audio control head" by using the height adjustment nut (A) and the "Tilt adjustment screw" (C) so that the tape transport is smooth at the "Take-up guide pole". Align the "Audio control head" height. (See Figure-7)

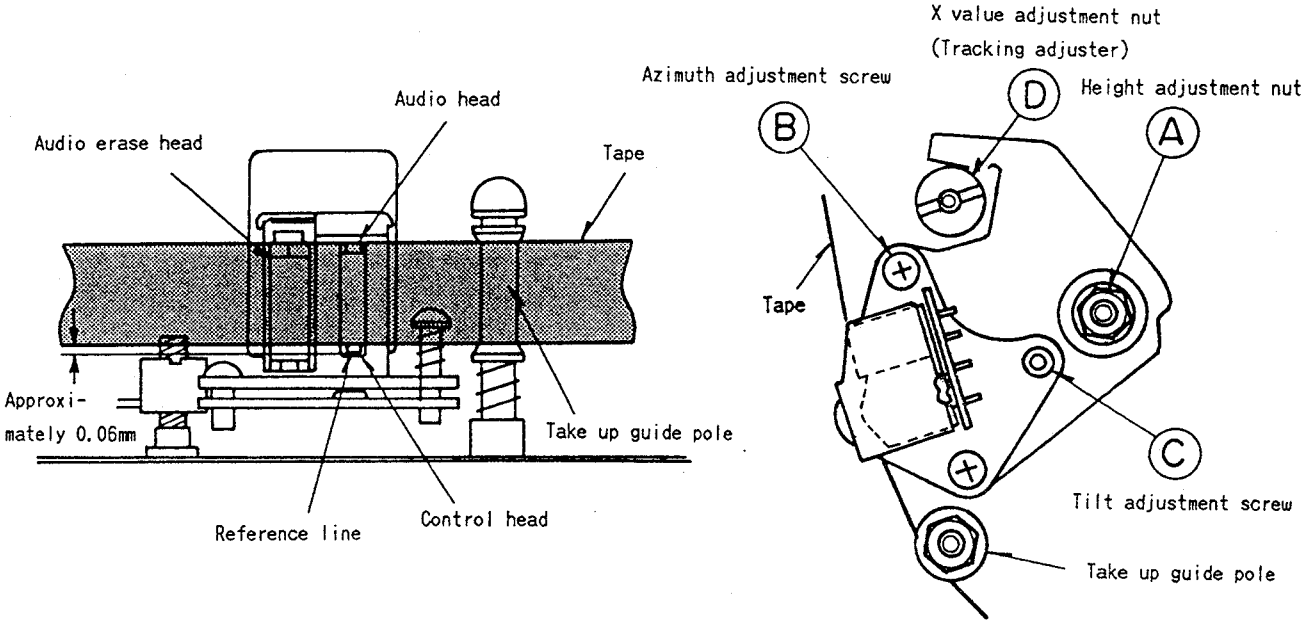


Fig-7

3. The fine adjustment is not required at this time.
   The following conditions are sufficient :
   (a) Proper tape transport between the "Audio control head" and the "Take-up guide pole".
   (b) Stable SERVO system operation (proper pickup of tape's recorded control signal).

4. X VALUE ADJUSTMENT (PB FM PEAK ADJUSTMENT)

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
MAIN C.B IC411 26 pin SERVO/SYSCON C.B TP201 2 pin	Oscilloscope	PLAY (SP) MODE Test tape TTV-P2

ADJ. Location	ADJ. Value
X value adjustment nut	Maximum level (CH1 PB Y FM signal)

TEST EQUIPMENT CONNECTING DIAGRAMS

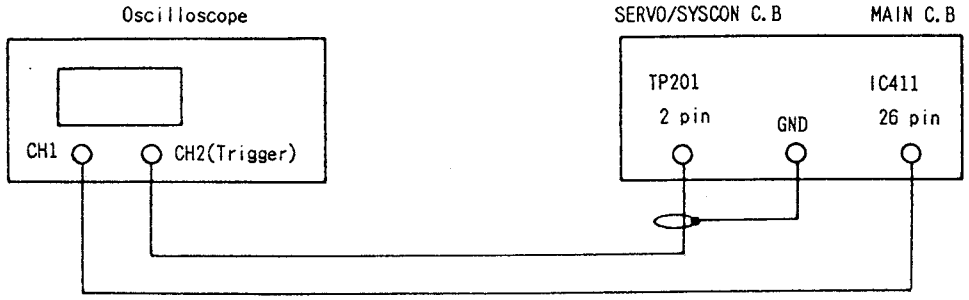


Fig-8

1. Connect the equipment as shown in Fig-8.

2. Adjust RV901 (Tracking volume) to its center position. (clockwise)

3. Adjust the "X value adjustment nut Ⓓ" for maximum PB FM Signal for CH1 by using TTV-P2 test tape. (See Figure-9)

4. After adjusting the "X value", check that the output level of the PB FM Signal for CH1 changes symmetrically by rotating RV901 (Tracking volume).

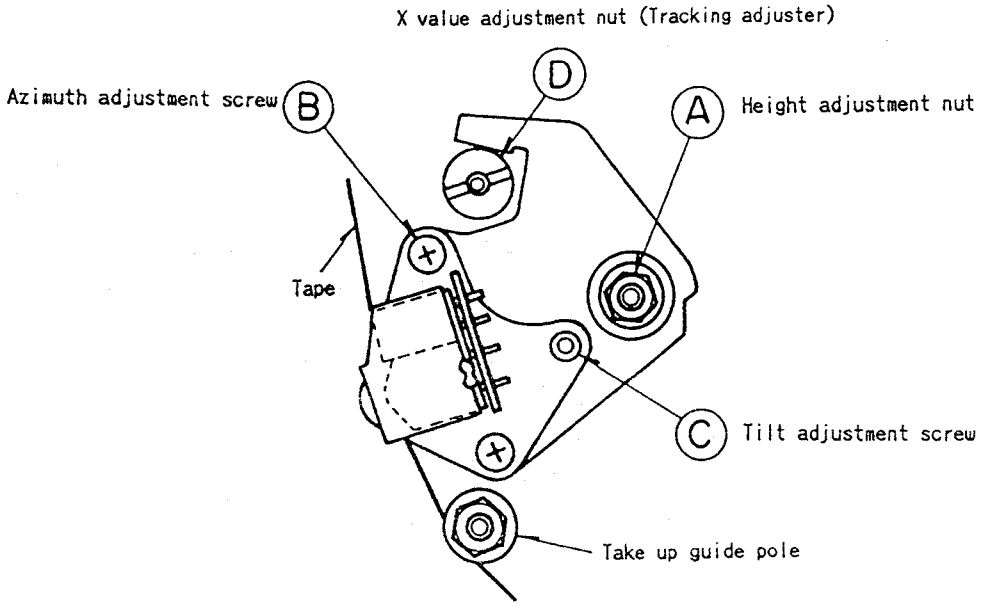


Fig-9

5. ENVELOPE WAVE FORM ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
MAIN C.B IC411 26 pin SERVO/SYSCON C.B TP201 2 pin	Oscilloscope	PLAY (SP) MODE Test tape TTV-P2

ADJ. Location	ADJ. Value
Guide rollers	Maximum level and correct waveform (PB Y FM Signal)

TEST EQUIPMENT CONNECTING DIAGRAMS

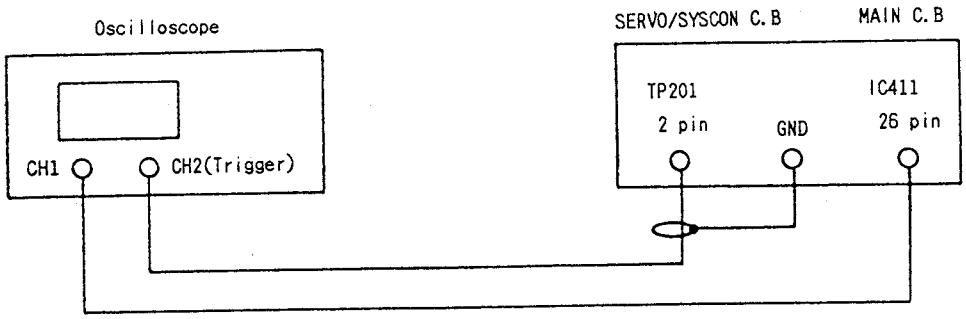


Fig.-10

1. Connect equipment as shown in Fig-10.

2. Playback the test tape TTV-P2.

3. The envelope waveform can be performed by adjusting the height of both the supply side and take-up side "Guide rollers".
   Finaly adjust the height of "Guide rollers" so that the envelope waveform is as flat as possible.

4. Set RV901 (Tracking Volume) to its center position and confirm that a nearly maximum level is obtained.
   Then rotate the RV901 (Tracking Volume) in both directions while adjusting the height of "Guide rollers", in order to obtain the envelope waveform which is as flat as possible.
   If the tape is above or lower the helical tape position, the envelope waveforms will take the shape as shown in Fig-11 and Fig-12.

5. Adjust for maximum flatness of the envelope waveform according to the Fig-11 and Fig-12.

6. After adjustment, rotate RV901 (Tracking Volume) counterclockwise and clockwise, and check that the waveform changes symmetrically.

7. Check the tape curl. (Refer to Section 2)

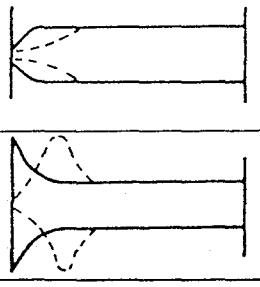
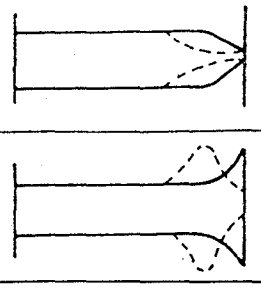
	Tape is too high	
	Supply side	Take-up side
When the tracking volume is rotated counterclockwise and clockwise directions.		
Adjustment	Supply side "Guide roller" rotated clockwise direction (lowers "Guide roller") to flatten envelope.	Take-up side "Guide roller" rotated clockwise direction (lowers "Guide roller") to flatten envelope.

Fig-11

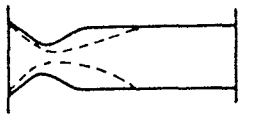
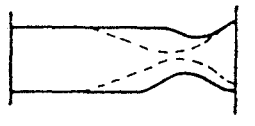
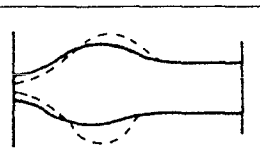
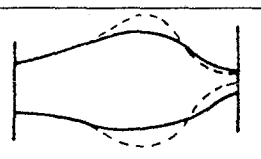
	Tape is too low	
	Supply side	Take-up side
When the tracking volume is rotated counterclockwise and clockwise directions.		
		
Adjustment	Supply side "Guide roller" rotated counterclockwise direction (raises "Guide roller") to flatten envelope.	Take-up side "Guide roller" rotated counterclockwise direction (raises "Guide roller") to flatten envelope.

Fig-12

6. ACE HEAD HEIGHT/ACE HEAD TILT ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
AUDIO OUTPUT	Oscilloscope AC voltmeter	PLAY (SP) MODE Test tape TTV-P1

ADJ. Location	ADJ. Value
Height adjustment nut Azimuth adjustment screw	Maximum level (AC voltmeter)
Tilt adjustment screw	

TEST EQUIPMENT CONNECTING DIAGRAMS

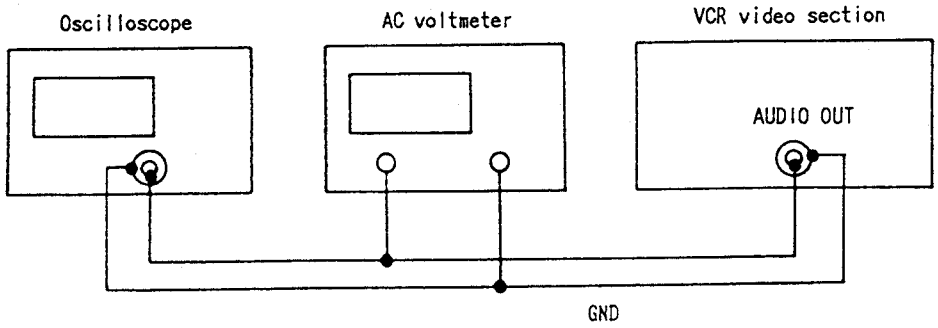


Fig-13

1. Connect equipment as shown in Fig-13.

2. Confirm that the running between the "Take-up guide roller" and the "ACE head" has no slack. If the tape has slack, take it up by turning the "Tilt adjustment screw Ⓒ". (See Figure-15)
   Then readjust "Guide roller " height in section 2 and the "X value" in section 4.

3. After confirming on the oscilloscope that a 1kHz audio signal is being output by playing back TTV-P1 test tape, adjust the "Height adjustment nut Ⓐ" so that the AC voltmeter's reading is brought to its maximum level. (See Figure-7)

4. Adjust the "Azimuth adjustment screw Ⓑ" so that the AC voltmeter's reading is brought to its maximum level. (See Figure-7)

7. ACE HEAD AZIMUTH ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
AUDIO OUTPUT	Oscilloscope AC voltmeter	PLAY (SP) MODE Test tape TTV-P2

ADJ. Location	ADJ. Value
Azimuth adjustment nut	Maximum level (AC voltmeter)

Fig-14

TEST EQUIPMENT CONNECTING DIAGRAMS

See Figure-13.

1. After confirming on the oscilloscope that a 6kHz audio signal is being output by playing back TTV-P2 test tape, adjust the "Azimuth adjustment screw (B)" so that the AC voltmeter's reading or oscilloscope waveform is brought to its maximum lebel. (See Figure-15)

Note : Fix the screw (B) and (C) with lock paint after readjustment.

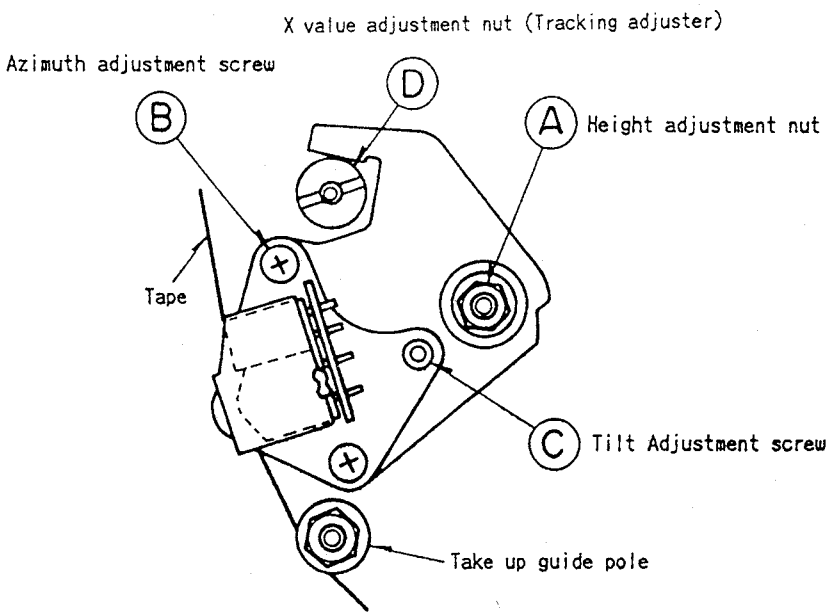
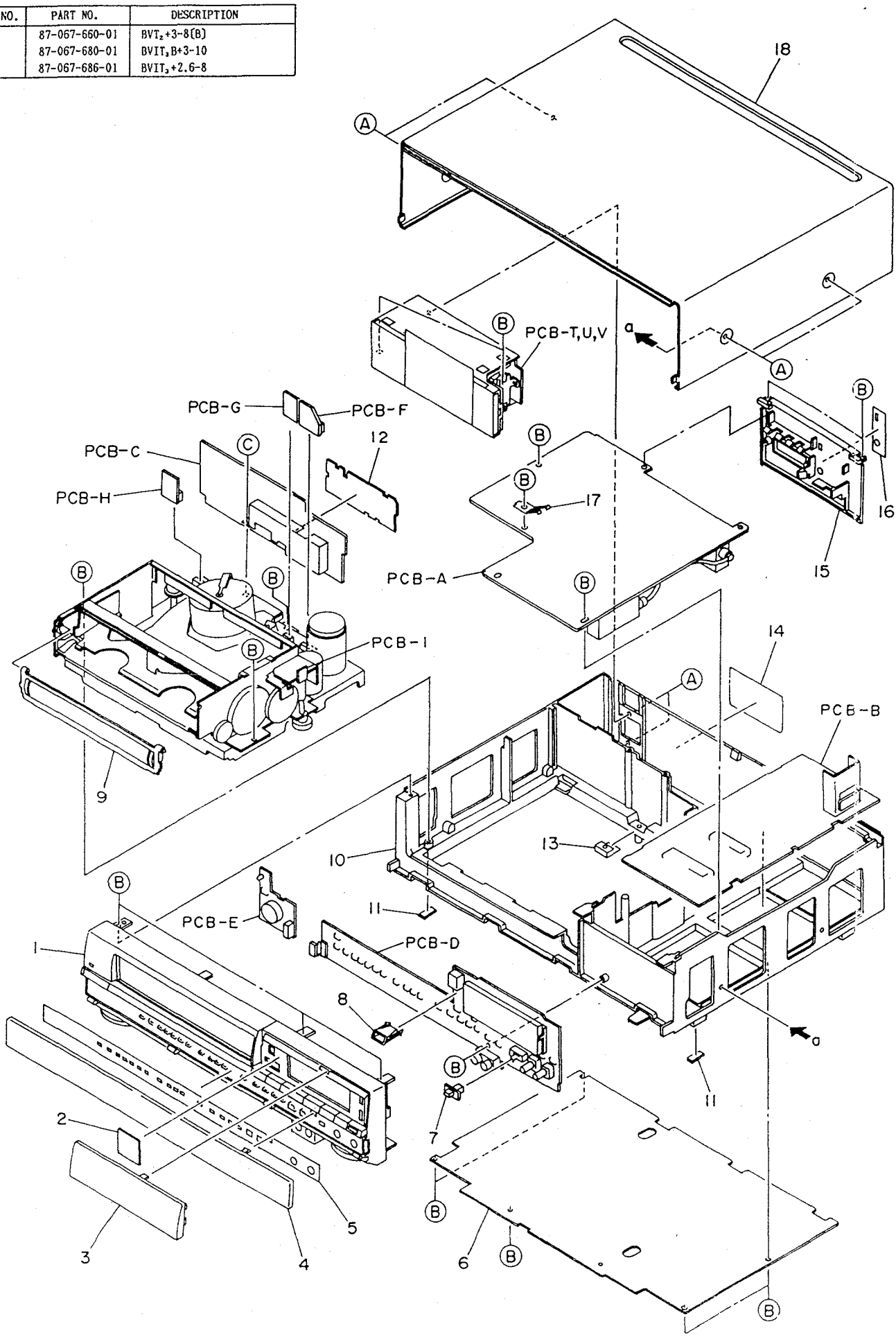


Fig-15

EXPLODED VIEW – 1

REF.NO.	PART NO.	DESCRIPTION
A	87-067-660-01	BVT$_2$+3-8(B)
B	87-067-680-01	BVIT$_3$B+3-10
C	87-067-686-01	BVIT$_3$+2.6-8

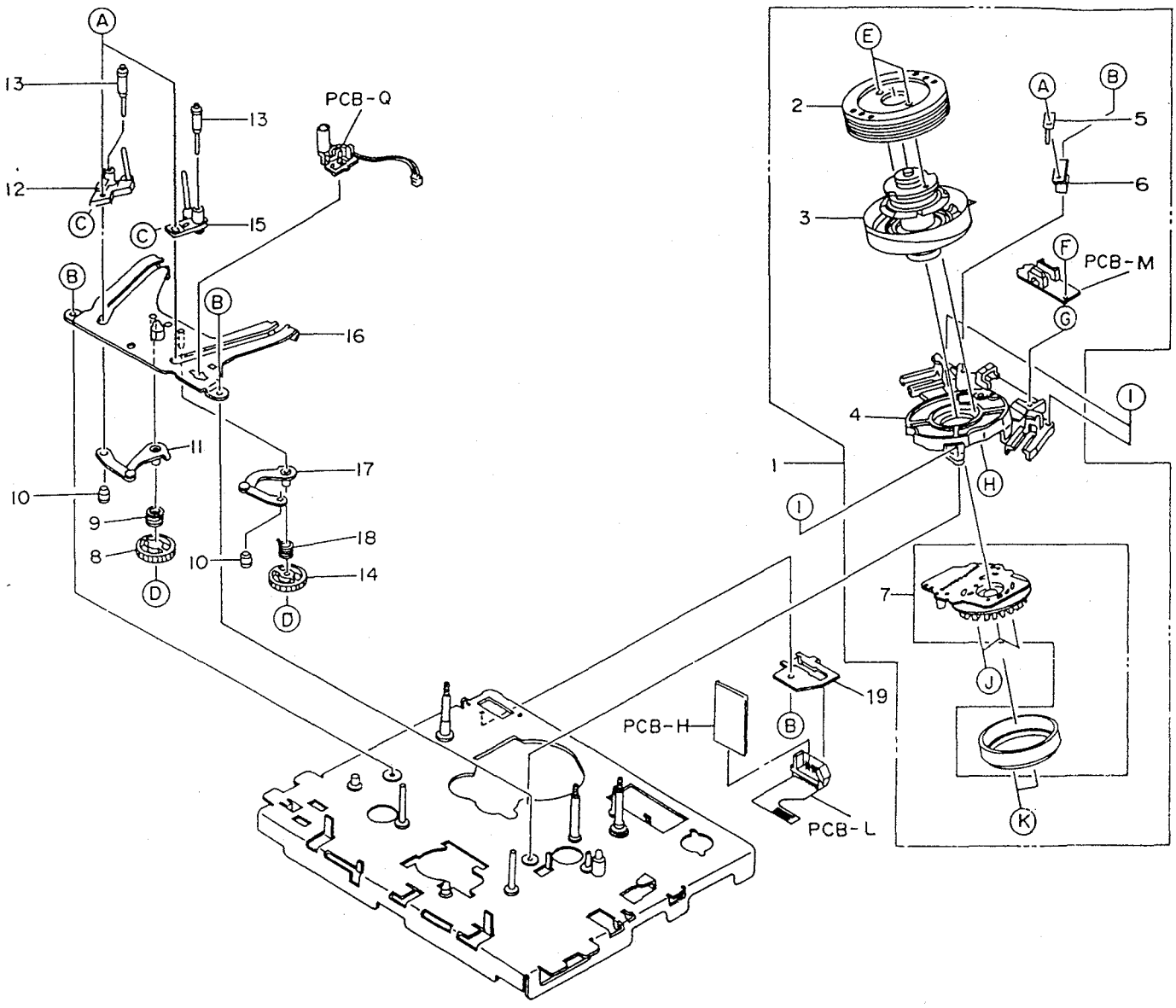


MECHANICAL PARTS LIST

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	1-1	★09-057-051-010	CABINET FRONT ASSY	*	1
	1-2	★89-JU5-008-010	FILTER(G50,G53,G55,DK510MK2)	*	1
	1-2	★89-JU6-004-010	FILTER(G51,DK510,DK910MK2)	*	1
	1-3	★89-JU5-003-010	WINDOW	*	1
	1-4	★89-JU5-002-010	DOOR(G50GPSH)	*	1
	1-4	★89-JU5-021-110	DOOR(G50DIPH)	*	1
	1-4	★89-JU5-031-010	DOOR(G50IPF)	*	1
	1-4	★89-JU6-001-010	DOOR(G51GPSE)	*	1
	1-4	★89-JU4-006-010	DOOR(G53AGPSE)	*	1
	1-4	★89-JU4-001-010	DOOR(G55GPSE)	*	1
	1-4	★89-JU4-004-010	DOOR(G55IPK)	*	1
	1-4	★89-JU6-009-010	DOOR(DK510)	*	1
	1-4	★89-JU5-037-010	DOOR(DK510MK2)	*	1
	1-4	★89-JU6-010-010	DOOR(DK910MK2)	*	1
	1-5	★89-JU5-007-010	PLATE,TIMER(G50,G53,G55,DK510MK2)	*	1
	1-5	★89-JU6-002-010	PLATE,TIMER(G51,DK510,DK910MK2)	*	1
	1-6	★89-JU5-020-010	BOTTOM,PLATE	*	1
	1-7	★89-JU5-015-010	KNOB,SLIDE(G50,G53,G55,DK510MK2)	*	1
	1-8	★89-JU7-201-010	REFLECTOR(G50,G53,G55,DK510MK2)	*	1
	1-9	★89-JU7-003-110	DOOR,CASSETTE(G50,G53,DK510MK2)	*	1
	1-9	★89-JU6-003-010	DOOR,CASSETTE(G51)	*	1
	1-9	★89-JU4-008-010	DOOR,CASSETTE(G55)	*	1
	1-9	★89-JU6-008-010	DOOR,CASSETTE(DK510)	*	1
	1-9	★89-JU9-002-110	DOOR,CASSETTE(DK910MK2)	*	1
	1-10	★89-JU5-010-010	CABINET,MAIN	*	1
	1-11	★89-JU5-018-010	FELT,FOOT	*	2
	1-12	---	SHIELD,RP2		1
	1-13	★89-JU5-217-010	CLAMP EARTH (G50,G51,DK510,DK510MK2,DK910MK2)	*	1
	1-14	★89-JU5-014-010	PLATE,SPEC(G50GPSH)	*	1
	1-14	★89-JU5-027-010	PLATE,SPEC(G50DIPH)	*	1
	1-14	★89-JU5-032-010	PLATE,SPEC(G50IPF)	*	1
	1-14	★89-JU6-005-010	PLATE,SPEC(G51GPSE)	*	1
	1-14	★89-JU4-009-010	PLATE,SPEC(G53AGPSE)	*	1
	1-14	★89-JU4-011-010	PLATE,SPEC(G55GPSE)	*	1
	1-14	★89-JU4-012-010	PLATE,SPEC(G55AGPSE)	*	1
	1-14	★89-JU4-010-010	PLATE,SPEC(G55IPK)	*	1
	1-14	★89-JU6-006-010	PLATE,SPEC(DK510)	*	1
	1-14	★89-JU5-039-010	PLATE,SPEC(DK510MK2)	*	1
	1-14	★89-JU6-011-010	PLATE,SPEC(DK910MK2)	*	1
	1-15	★89-JU5-011-210	PANEL,JACK (G50,DK510,DK510MK2,DK910MK2)	*	1
	1-15	★89-JU4-003-210	PANEL,JACK(G51,G53,G55)	*	1
	1-16	★89-JU5-024-010	PLATE,JACK(G50GPSH,G50IPF,G53,G55)	*	1
	1-16	★89-JU5-025-010	PLATE,JACK(G50DIPH)	*	1
	1-16	★89-JU6-007-010	PLATE,JACK(DK510)	*	1
	1-16	★89-JU5-038-010	PLATE,JACK(DK510MK2,DK910MK2)	*	1
	1-17	★89-JU7-211-110	PLATE,EARTH	*	1
	1-18	★89-JU5-009-010	CABINET,STEEL	*	1

EXPLODED VIEW – 2

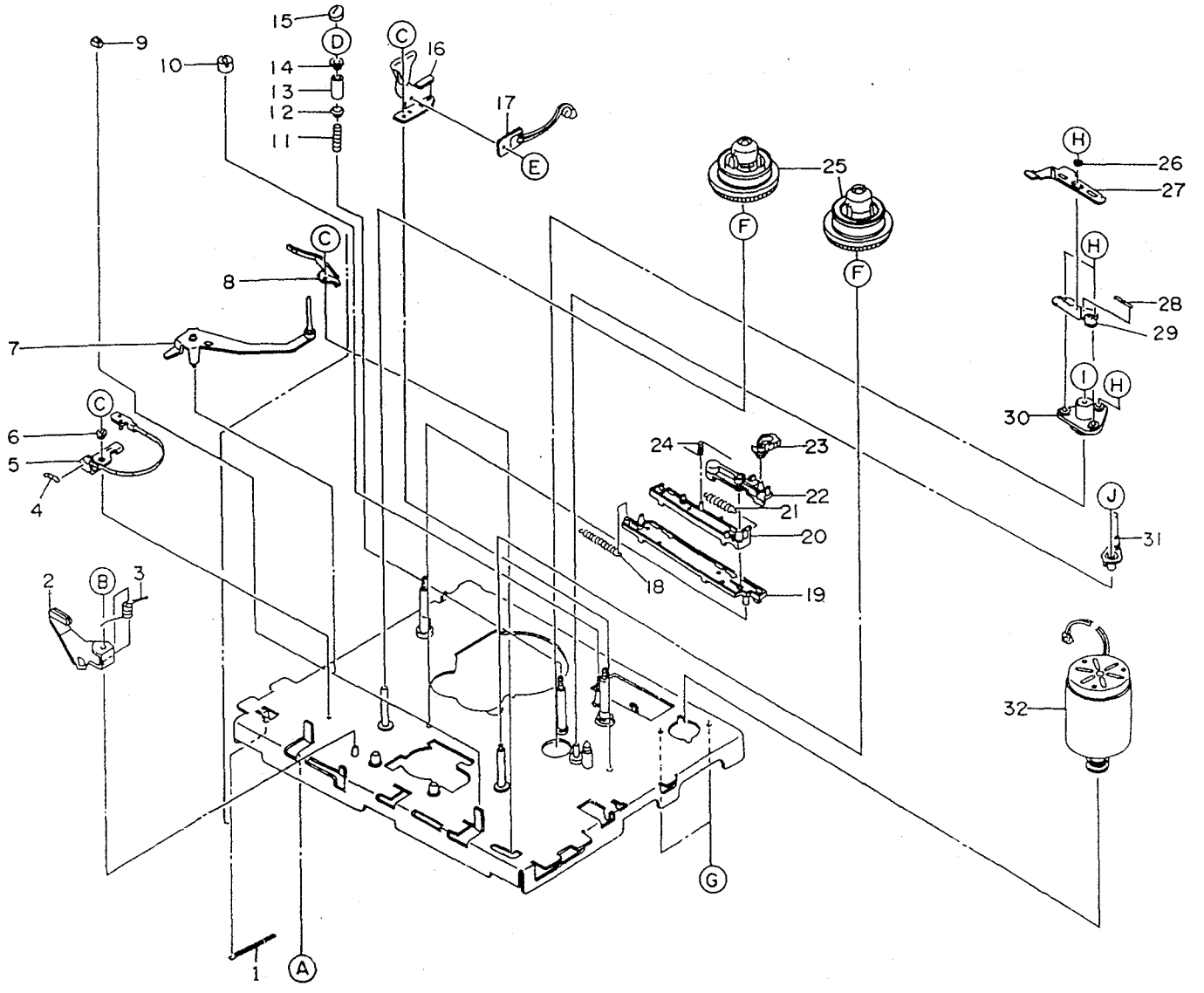
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-665-000-00	CUP SCREW 2.6×3	E	S9-972-000-00	BIND TAMS SCREW 3×8	I	S9-205-000-00	C TAPPING SCREW 3×10
B	S9-192-000-00	C TAPPING SCREW 2.6×5	F	S9-973-000-00	W TAMS SCREW 2.6×6	J	S9-050-000-00	SCREW 2.6×2.0
C	S9-952-000-00	SET SCREW 2.0×3(PLANE)	G	S9-715-000-00	WASHER 2.6	K	S9-098-000-00	TAMS SCREW 2.6×6
D	S9-884-000-00	PW CUT 2.6×6×0.5	H	S9-552-000-00	SCREW(FOR CAMERA) 2×5			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	2-1	*S8-059-013-090	CYLINDER ASSY		1
	2-2	S8-059-010-160	UPPER DRUM		1
	2-3	*S8-059-013-040	LOWER DRUM ASSY		1
	2-4	*S8-059-010-010	CYLINDER MOUNT		1
	2-5	*S8-059-010-230	DRUM EARTH		1
	2-6	*S8-059-010-020	DRUM EARTH BRACKET		1
	2-7	S6-004-090-010	MOTOR TM82		1
	2-8	*S8-059-030-060	T LOADING GEAR L		1
	2-9	*S8-059-030-080	LOADING GEAR SPRING L		1
	2-10	*S8-059-030-140	LOADING BOSS		2
	2-11	*S8-059-035-020	LOADING PLATE L SEMI ASSY		1
	2-12	*S8-059-030-040	LOADING BLOCK L		1
	2-13	*S8-000-030-370	ROLLER POST ST		2
	2-14	*S8-059-030-070	T LOADING GEAR R		1
	2-15	*S8-059-030-050	LOADING BLOCK R		1
	2-16	*S8-059-035-010	LOADING BASE SEMI ASSY		1
	2-17	*S8-059-035-030	LOADING PLATE R SEMI ASSY		1
	2-18	*S8-059-030-090	LOADING GEAR SPRING R		1
	2-19	---	CONNECTOR BRACKET		1

EXPLODED VIEW – 3

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-999-030-15	PW CUT 2.1×4×0.5	E	S9-096-000-00	TAMS SCREW 2.6×4	I	S9-999-060-00	NYLON WASHER 2.92×5×0.5
B	S9-876-000-00	PW CUT 2.1×5×0.5	F	S9-912-000-00	PW 3.1×6×0.5	J	S9-884-000-00	PW 2.6×6×0.5CUT
C	S9-191-000-00	C TAPPING SCREW 2.6×4	G	S9-105-000-00	TAMS SCREW 3×4			
D	S9-453-000-00	NUT 3.0	H	S9-495-000-00	C TAPPING SCREW 2.6×8			

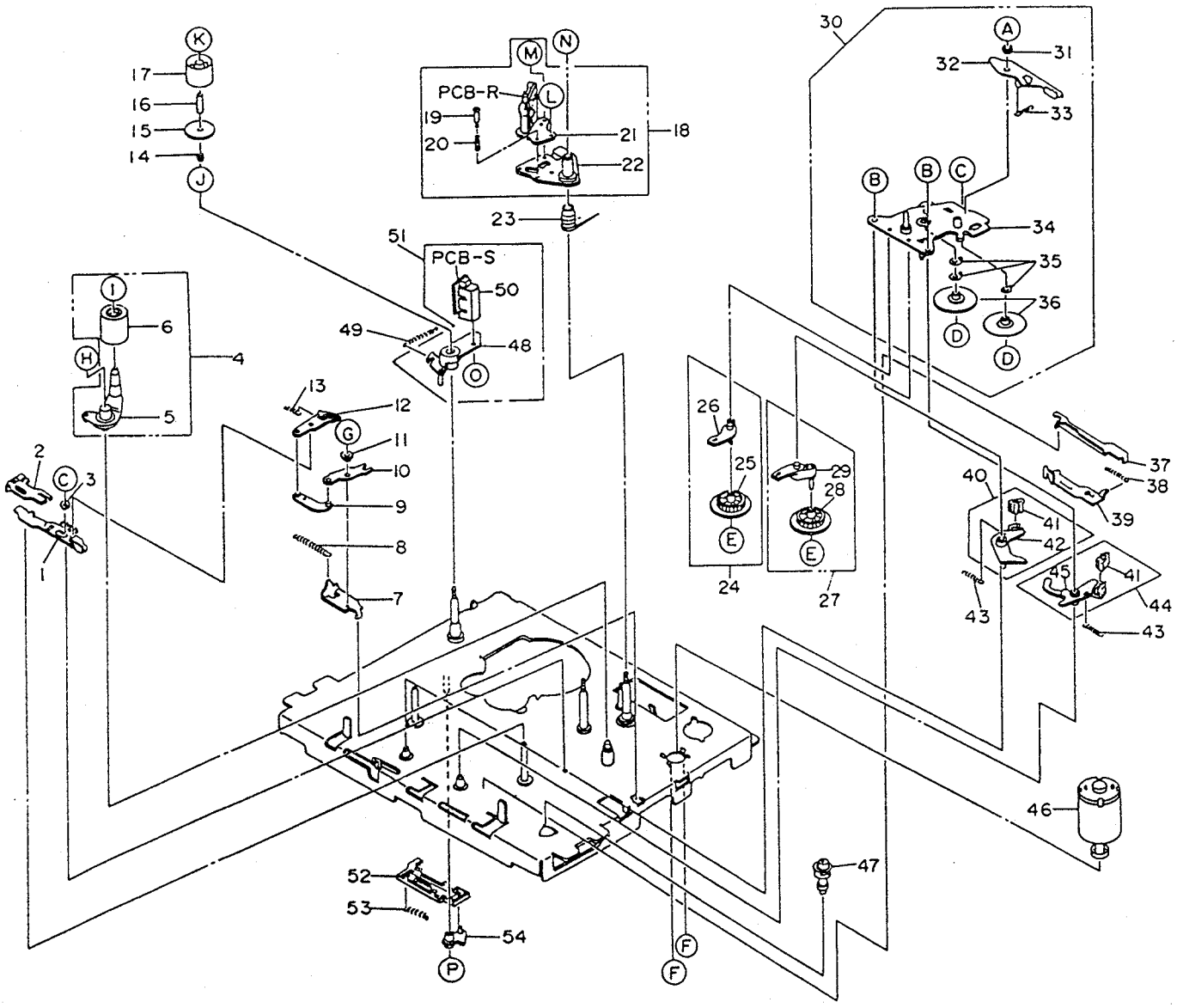


PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q'TY
	3-1	★S8-059-080-200	BT ACTUATE PLATE SPRING		1
	3-2	★S8-059-103-040	S SOFT BRAKE ASSY		1
	3-3	★S8-059-100-220	S SOFT BRAKE SPRING		1
	3-4	★S8-059-080-170	BAND HOLDER SPRING		1
	3-5	★S8-059-083-020	BT BAND ASSY		1
	3-6	★S8-059-080-150	BAND HOLDER COLLAR		1
	3-7	★S8-059-085-010	BT ARM SEMI ASSY		1
	3-8	★S8-059-080-090	BACK TENSION SUPPORT		1
	3-9	★S8-059-020-230	DAMPER RUBBER		1
	3-10	★S8-059-020-290	TRACKING ADJUSTER		1
	3-11	★S8-059-020-260	TAPE GUIDE SPRING		1
	3-12	★S8-000-030-290	TAPE GUIDE FLANGE D		1
	3-13	★S8-000-030-140	TAPE GUIDE		1
	3-14	★S8-000-030-280	TAPE GUIDE FLANGE C		1
	3-15	★S8-000-030-190	GUIDE CAP		1
	3-16	★S8-059-023-010	OPEN ANGLE ASSY		1
	3-17	★S6-808-080-040	DEW SENSOR EYH-S10R		1
	3-18	★S8-059-100-100	BRAKE ACTUATE BASE SPRING		1
	3-19	★S8-059-100-090	BRAKE ACTUATE BASE		1
	3-20	★S8-059-100-110	BRAKE PLATE		1

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	3-21	★S8-059-100-120	BRAKE PLATE SPRING		1
	3-22	★S8-059-100-130	TRIGGER LEVER		1
	3-23	★S8-059-100-140	TRIGGER HOOK		1
	3-24	★S8-059-100-230	TRIGGER LEVER SPRING		1
	3-25	S8-059-053-010	REEL ASSY		2
	3-26	★S8-059-170-100	RG SLIDE PLATE COLLAR		1
	3-27	★S8-059-170-030	RG SLIDE PLATE		1
	3-28	★S8-059-170-110	RG SLIDE SPRING		1
	3-29	★S8-059-170-090	RG SLIDE BASE		1
	3-30	★S8-059-073-010	METAL HOUSING ASSY		1
	3-31	★S8-059-175-010	RG ARM SEMI ASSY		1
	3-32	S8-059-073-020	CAPSTAN MOTOR ASSY		1

EXPLODED VIEW – 4

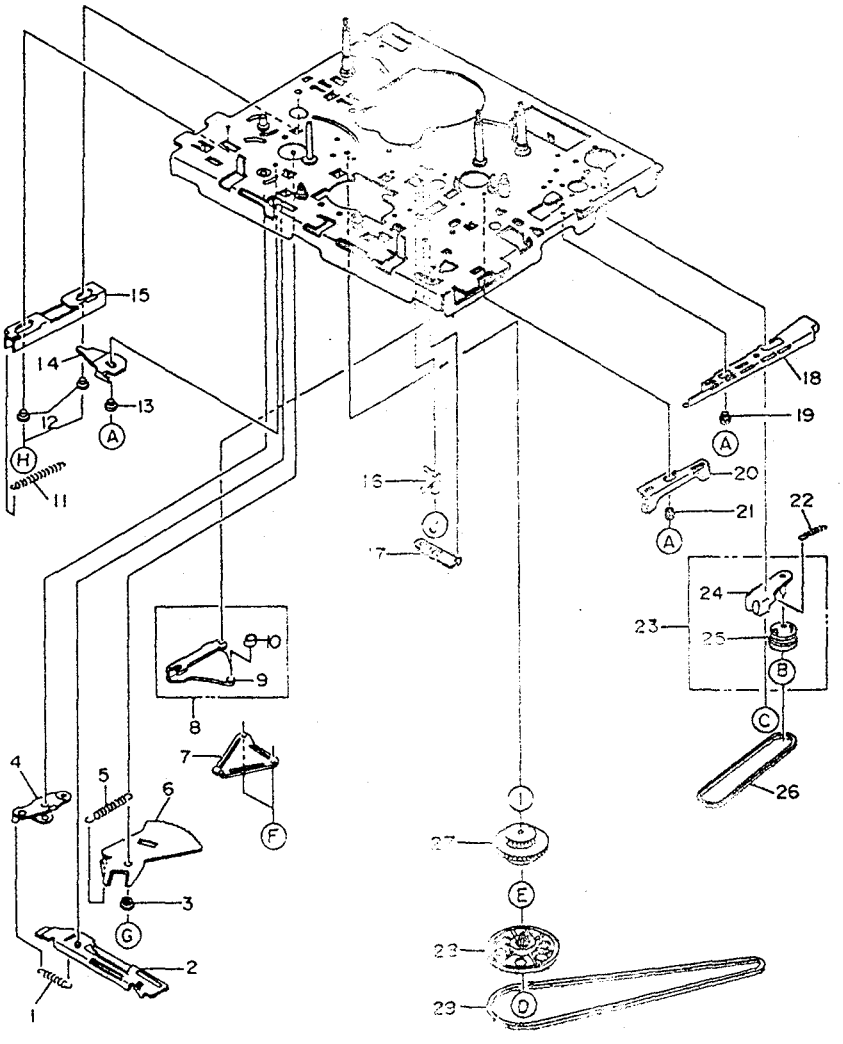
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-974-000-00	SL FH SCREW 2×3	G	S9-096-000-00	TAMS SCREW 2.6×4	M	S9-705-000-00	LONG LOCK SCREW 2.6×7
B	S9-097-000-00	TAMS SCREW 2×4	H	S9-999-030-00	PW CUT 5×8×0.5	N	S9-953-000-00	NYLON NUT M3
C	S9-192-000-00	C TAPPING SCREW 2.6×5	I	S9-038-000-00	SCREW 2.6×4	O	S9-114-000-00	SCREW FLANGE 2×3
D	S9-500-000-00	E RING S1.5	J	S9-387-000-00	PLANE WASHER 3×8×0.5	P	S9-876-000-00	PW 2.1×5×0.5CUT
E	S9-743-000-00	PW CUT 1.6×3.8×0.3	K	S9-953-000-00	NYLON NUT M3			
F	S9-105-000-00	C TAPPING SCREW 3×4	L	S9-999-000-25	SCREW 3.6 (SHAPE TYPE)			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q. TY
	4-1	*S8-059-060-240	P SLIDE PLATE A		1
	4-2	*S8-059-060-250	P SLIDE PLATE B		1
	4-3	*S8-059-060-180	COLLAR		1
	4-4	S8-059-063-010	PINCH ROLLER ARM ASSY		1
	4-5	*S8-059-065-010	PINCH ROLLER ARM SEMI ASSY		1
	4-6	S8-000-090-220	PINCH ROLLER A		1
	4-7	*S8-059-060-190	P ANGLE HOLDER		1
	4-8	*S8-059-060-200	P-SPRING,ROLLER		1
	4-9	*S8-059-060-060	JOINT PLATE		1
	4-10	*S8-059-060-050	P ACTUATE ANGLE		1
	4-11	*S8-059-060-180	COLLAR		1
	4-12	*S8-059-060-040	P ACTUATE ARM		1
	4-13	*S8-059-060-090	P-SPRING,ACTUATE ARM		1
	4-14	*S8-059-040-090	TAPE GUIDE FLANGE SPRING		1
	4-15	*S8-059-040-070	TAPE GUIDE FLANGE A		1
	4-16	*S8-059-040-060	IMPEDANCE ROLLER SLEEVE		1
	4-17	*S8-059-040-050	IMPEDANCE ROLLER		1
	4-18	*S8-059-043-080	HEAD BASE ASSY		1
	4-19	---	AZIMUTH SPRING SCREW		1
	4-20	---	AZIMUTH SPRING		1
	4-21	S6-204-150-060	ACE HEAD HV225211		1
	4-22	---	HEAD BASE SEMI ASSY		1
	4-23	---	HEAD SPRING		1
	4-24	*S8-059-093-050	P GEAR ASSY		1
	4-25	*S8-059-090-200	PLAY GEAR		1
	4-26	*S8-059-093-030	P GEAR ARM ASSY		1
	4-27	*S8-059-093-060	RF GEAR ASSY		1
	4-28	*S8-059-090-220	FF GEAR		1
	4-29	*S8-059-093-040	RF GEAR ARM ASSY		1
	4-30	*S8-059-093-070	SUB PLATE ASSY		1
	4-31	*S8-059-100-070	T SOFT BRAKE ARM COLLAR		1
	4-32	*S8-059-103-030	T SOFT BRAKE ASSY		1
	4-33	*S8-059-100-060	T-SPRING,SOFT BRAKE ARM		1
	4-34	---	SUB PLATE SEMI ASSY		1
	4-35	*S8-000-100-250	WAVE WASHER		3
	4-36	*S8-059-090-060	REEL DRIVE GEAR		2
	4-37	*S8-059-100-160	BRAKE LIFTER		1
	4-38	*S8-059-100-180	L BRAKE ACTUATOR SPRING		1
	4-39	*S8-059-100-170	L BRAKE ACTUATOR		1
	4-40	*S8-059-103-010	S BRAKE ARM ASSY		1
	4-41	*S8-059-100-190	BRAKE SHOE		2
	4-42	*S8-059-100-010	S BRAKE ARM		1
	4-43	*S8-059-100-020	BRAKE ARM SPRING		2
	4-44	*S8-059-103-020	T BRAKE ARM ASSY		1
	4-45	*S8-059-100-030	T BRAKE ARM		1
	4-46	S8-059-113-010	LM ASSY		1
	4-47	*S8-059-113-020	TRIGGER BEARING ASSY		1
	4-48	---	FE PLATE		1
	4-49	*S8-059-040-080	FE PLATE SPRING		1
	4-50	*S6-204-150-030	FE HEAD HVFMD 0006		1
	4-51	*S8-059-043-020	FE PLATE ASSY		1
	4-52	*S8-059-040-100	FE SLIDE PLATE		1
	4-53	*S8-059-040-120	FE ACTUATE SPRING		1
	4-54	*S8-059-040-110	FE ACTUATE LEVER		1

EXPLODED VIEW – 5

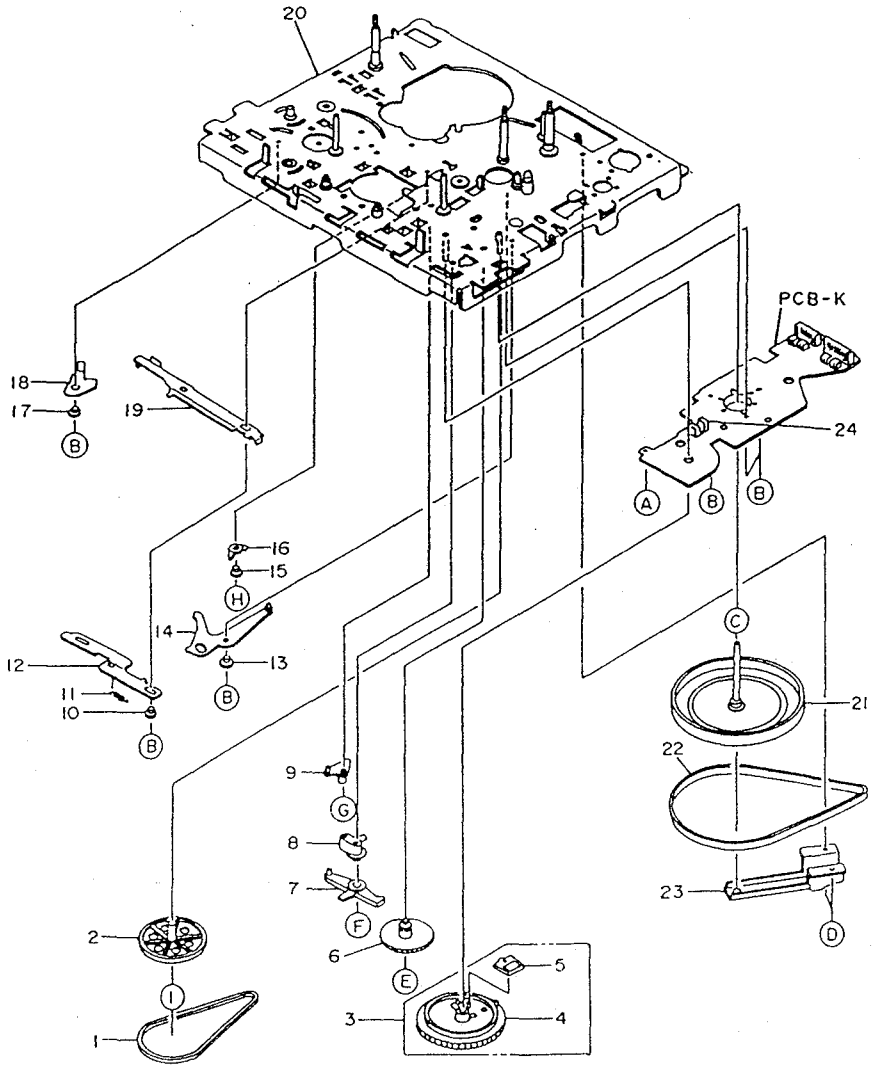
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-192-000-00	C TAPPING SCREW 2.6×5	E	S9-999-060-[illegible]	NYLON WASHER 2.8S×6×0.3	I	S9-853-000-00	NYLON WASHEER 3.1×6×0.3
B	S9-743-000-00	PW CUT 1.6×3.8×0.5	F	S9-078-000-[illegible]	TAPS SCREW 2×5	J	S9-876-000-00	PW CUT 2.1×5×0.5
C	S9-876-000-00	PW CUT 2.1×6×0.5	G	S9-203-000-[illegible]	C TAPPING SCREW 3×8			
D	S9-884-000-00	PW CUT 2.6×6×0.5	H	S9-840-000-00	S TAPPING SCREW 2.6×8			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTIO	COMMON MODEL	Q'TY
	5-1	*S8-059-120-050	LOAC NG ACTUATOR SPRING		1
	5-2	*S8-059-125-030	LOADING ACTUATOR SEMI ASSY		1
	5-3	*S8-059-120-100	L GEAR PLATE COLLAR		1
	5-4	*S8-059-125-020	LOAD NG ACTUATE LEVER SEMI ASSY		1
	5-5	*S8-059-120-120	L GEAR PLATE SPRING		1
	5-6	*S8-059-120-090	L GEAR PLATE		1
	5-7	*S8-059-120-110	LOAD NG LEVER REINFORCE PLATE		1
	5-8	*S8-059-123-010	LOAD NG LEVER ASSY		1
	5-9	---	LOADING LEVER SEMI ASSY		1
	5-10	---	CAM ROLLER		1
	5-11	*S8-059-080-130	RACK TENSION SPRING		1
	5-12	*S8-059-080-210	BT ACTUATE PLATE COLLAR		2
	5-13	*S8-059-060-180	COLLAR		1
	5-14	*S8-059-080-180	BT ACTUATE LEVER		1
	5-15	*S8-059-080-190	BT ACTUATE PLATE		1
	5-16	*S8-059-170-010	RG ACTUATE ARM		1
	5-17	*S8-059-170-020	RG ACTUATE		1
	5-18	*S8-059-150-070	L BRAKE PLATE		1
	5-19	*S8-059-060-180	COLLAR		1
	5-20	*S8-059-150-080	EJECT ACTUATOR		1
	5-21	*S8-059-060-180	COLLAR		1
	5-22	*S8-059-150-110	IDLER ARM SPRING		1
	5-23	*S8-059-153-030	E IDLER ARM ASSY		1
	5-24	---	E IDLER ARM SEMI ASSY		1
	5-25	---	EJECT PULLEY		1
	5-26	S8-059-150-060	FL BELT		1
	5-27	*S8-059-093-020	CLUTCH ASSY		1
	5-28	*S8-059-093-010	MIDDLE PULLEY ASSY		1
	5-29	*S8-059-090-170	DRIVE BELT		1

EXPLODED VIEW – 6

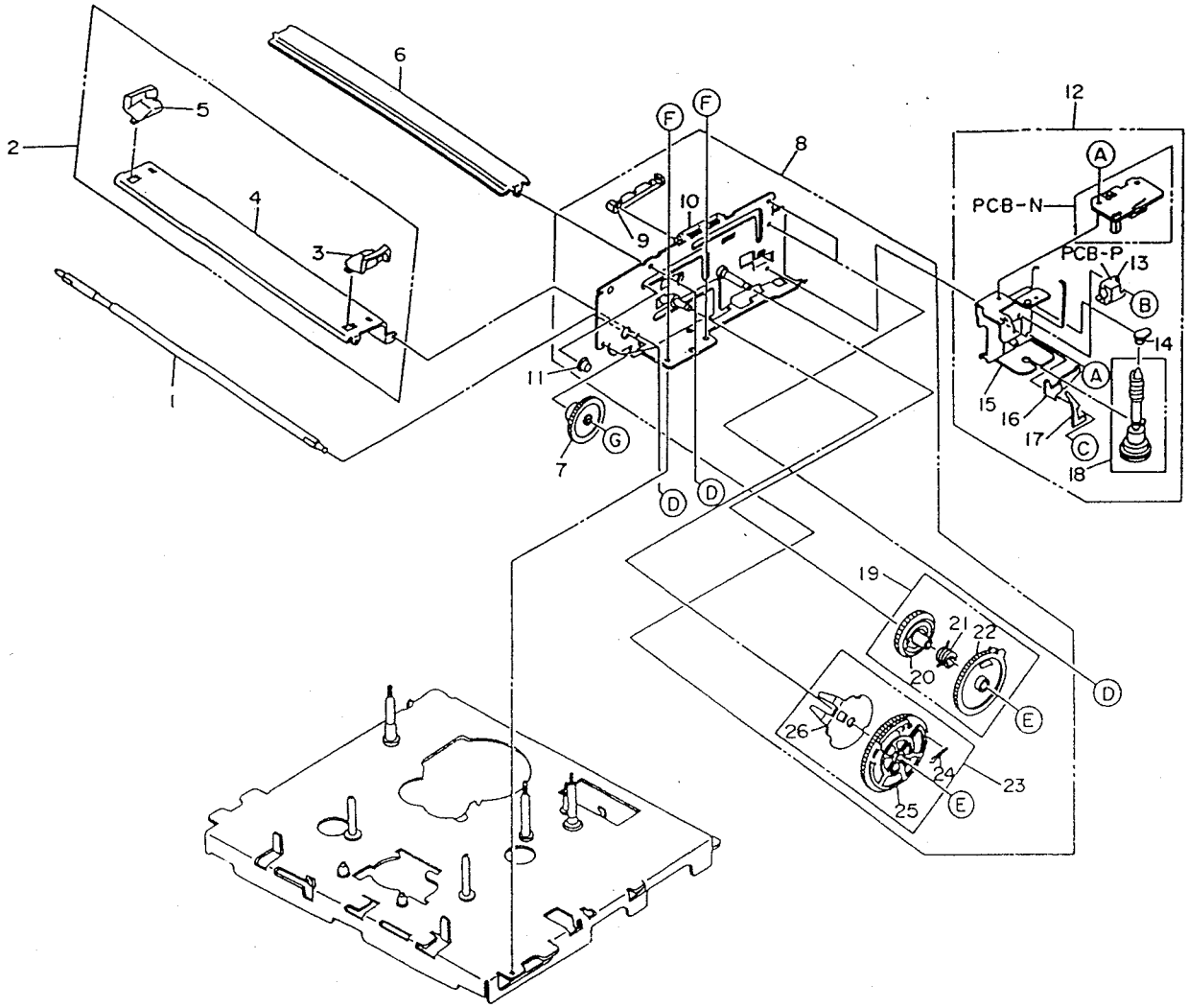
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-671-000-00	S TAPPING SCREW 2.6×5	D	S9-202-000-00	C TAPPING SCREW 3×5	G	S9-884-000-00	PW CUT 2.6×6×0.5
B	S9-192-000-00	C TAPPING SCREW 2.6×5	E	S9-876-000-00	PW CUT 2.1×5×0.5	H	S9-999-180-10	C TAPPING FH SCREW 2.6×4
C	S9-912-000-00	PW 3.1×6×0.5	F	S9-999-030-10	PW CUT 2.6×8×0.5	I	S9-743-000-00	PW CUT 1.6×3.8×0.3



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	6-1	S8-059-110-060	LOADING BELT		1
	6-2	*S8-059-110-030	LOADING PULLEY		1
	6-3	*S8-059-113-030	LOADING CAM ASSY		1
	6-4	---	LOADING CAM		1
	6-5	---	S BRUSH		1
	6-6	*S8-059-110-040	LOADING GEAR		1
	6-7	*S8-059-110-140	EJECT ARM		1
	6-8	*S8-059-110-130	BRAKE ACTUATE ARM		1
	6-9	*S8-059-110-120	SEARCH ARM B		1
	6-10	*S8-059-060-110	P SLIDER COLLAR		1
	6-11	*S8-059-060-230	P-SPRING,SLIDER		1
	6-12	*S8-059-060-100	P SLIDER		1
	6-13	*S8-059-060-170	P CAM LEVER COLLAR		1
	6-14	*S8-059-065-020	P CAM LEVER SEMI ASSY		1
	6-15	*S8-059-060-130	P CRANK COLLAR		1
	6-16	*S8-059-060-120	P CRANK		1
	6-17	*S8-059-060-180	COLLAR		1
	6-18	*S8-059-080-230	BT RETURN LEVER		1
	6-19	*S8-059-080-100	BT CHANGE PLATE		1
	6-20	---	CHASSIS SEMI ASSY		1
	6-21	*S8-059-070-140	FLYWHEEL CAPSTAN		1
	6-22	S8-059-070-100	MAIN BELT		1
	6-23	*S8-059-073-030	FL ANGLE ASSY		1
	6-24	*S6-808-080-030	REEL SENSOR		1

EXPLODED VIEW – 7

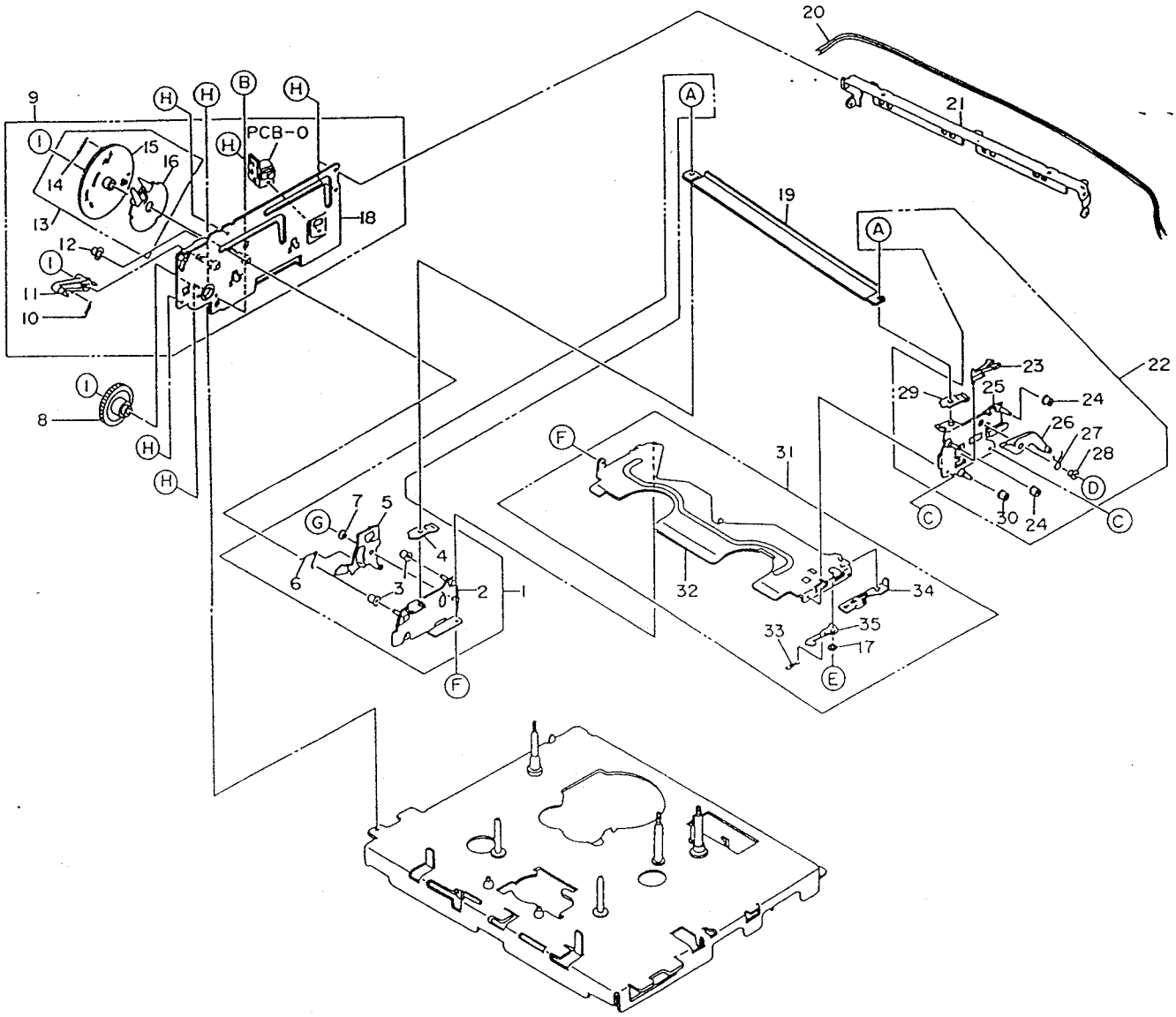
REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-096-000-00	TAMS SCREW 2.6×4	D	S9-096-000-00	TAMS SCREW 2.6×4	G	S9-504-000-00	E RING S2.5
B	S9-078-000-00	TAMS SCREW 2×5	E	S9-504-000-00	E RING S2.5			
C	S9-743-000-00	PW CUT 1.6×3.8×0.3	F	S9-192-000-00	C TAPPING SCREW 2.6×4			



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
	7-1	★S8-059-160-600	SYNCHRONIZE SHAFT		1
	7-2	---	FRONT ANGLE ASSY		1
	7-3	★S8-059-160-250	TAPE GUIDE R		1
	7-4	★S8-059-160-180	FRONT ANGLE		1
	7-5	★S8-059-160-240	TAPE GUIDE L		1
	7-6	★S8-000-220-070	UPPER PLATE		1
	7-7	★S8-059-160-170	SYNCHRONIZE GEAR A		2
	7-8	★S8-059-163-220	FRAME R ASSY		1
	7-9	---	OPEN LEVER GUIDE		1
	7-10	---	FRAME R SEMI ASSY		1
	7-11	---	GUIDE SLEEVE		1
	7-12	★S8-059-163-180	C LOAD BRACKET ASSY		1
	7-13	---	SENSOR P.C.B RM ASSY		1
	7-14	---	F WORM BEARING A		1
	7-15	---	C LOAD BRACKET SEMI ASSY		1
	7-16	---	IN SW LEVER		1
	7-17	---	S SW LEVER		1
	7-18	★S8-059-163-190	F LOADING CLUTCH ASSY		1
	7-19	★S8-059-163-210	WORMWHEEL ASSY		1
	7-20	---	FRICTION GEAR		1
	7-21	---	FRICTION SPRING		1
	7-22	---	WORMWHEEL		1
	7-23	★S8-059-163-120	LIFT GEAR R ASSY		1
	7-24	---	LP SPRING		1
	7-25	---	LIFT GEAR R		1
	7-26	---	LIFT ARM		1

EXPLODED VIEW – 8

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
A	S9-833-000-00	SCREW 2.3×2	D	S9-967-000-00	SL SCREW 2×4	G	S9-966-000-00	SL SCREW 2×2.5
B	S9-192-000-00	C TAPPING SCREW 2.6×4	E	S9-968-000-00	SL SCREW 2.6×3	H	S9-096-000-00	TAMS SCREW 2.6×4
C	S9-556-000-00	SCREW 2.6×3	F	S9-991-000-00	SCREW 2.3×2.5	I	S9-504-000-00	E RING S2.5



PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
■ S					
	8-1	*S8-059-163-090	SIDE PLATE L ASSY		1
	8-2	---	SIDE PLATE L SEMI ASSY		1
	8-3	---	GUIDE ROLLER		2
	8-4	---	CASSETTE PUSH PLATE		1
■ S	8-5	---	C LCOK PLATE L		1
	8-6	---	LOCK PLATE SPRING L		1
	8-7	---	LOCK PLATE COLLAR		1
	8-8	*S8-059-160-170	SYNCHRONIZE GEAR A		2
	8-9	*S8-059-163-130	FRAME L ASSY		1
■ C	8-10	---	LIFT LEVER SPRING		1
	8-11	*S8-000-220-760	LIFT LEVER		1
■ E	8-12	---	GUIDE SLEEVE		1
	8-13	*S8-059-163-140	LIFT GEAR L ASSY		1
	8-14	---	LP SPRING		1
■ F	8-15	---	LIFT GEAR L		1
	8-16	---	LIFT ARM		1
■ E	8-17	---	COLLAR		1
	8-18	---	FRAME L SEMI ASSY		1
	8-19	*S8-000-220-650	TOP STAY		1
	8-20	---	END SENSOR WIRE		1
	8-21	*S8-059-160-090	REAR ANGLE		1
	8-22	*S8-059-163-080	SIDE PLATE R ASSY		1
	8-23	---	LOCK RELEASE LEVER		1
	8-24	---	GUIDE ROLLER		2
	8-25	---	SIDE PLATE R SEMI ASSY		1
■ W	8-26	*S8-000-220-250	OPEN LEVER		1
	8-27	---	OPEN LEVER SPRING		1
	8-28	---	OPEN LEVER COLLAR		1
■ W	8-29	---	CASSETTE PUSH PLATE		1
	8-30	---	GUIDE ROLLER		1
■ S	8-31	*S8-059-163-060	CASSETTE HOLDER ASSY		1
	8-32	---	CASSETTE HOLDER		1
	8-33	---	LOCK SPRING		1
■ W	8-34	---	SLIDE PLATE		1
	8-35	---	C LOCK PLATE A		1

■ D

■ S

■ N

■ I

■ W

■ ACCESSORIES/PACKAGE LIST

■ S

PART NO. CHANGED TO	REF. NO.	PART NO.	DESCRIPTION	COMMON MODEL	Q, TY
■ W					
■ I	1	★ 89 – JU5 – 903 – 010	INSTRUCTION BOOKLET, KE (DK910MK II)	※	1
	2	★ 89 – JU6 – 903 – 010	INSTRUCTION BOOKLET, KE (DK510MK II)	※	1
■ S	3	★ 87 – 034 – 593 – 010	CORD,RF PAL		1
■ W	4	★ 87 – 034 – 755 – 010	AC CORDSET ASSY,E		1
■ S	5	★ 89 – JU5 – 638 – 010	REMOTE UNIT,RC – TG50P (DK510MK II)		1
■ W	6	★ 89 – JU5 – 639 – 010	REMOTE UNIT,RC – TG51P (DK910MK II)	※	1

■ S

■ W